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THE RUBBER AGE

ESTABLISHED 1917

250 West 57th Street, New York

COVERS ALL PHASES OF THE PRODUCTION AND MARKETING OF CRUDE RUBBER AND THE MANUFACTURE AND DISTRIBUTION OF RUBBER GOODS

Vol. 32 MARCH, 1933 No. 10

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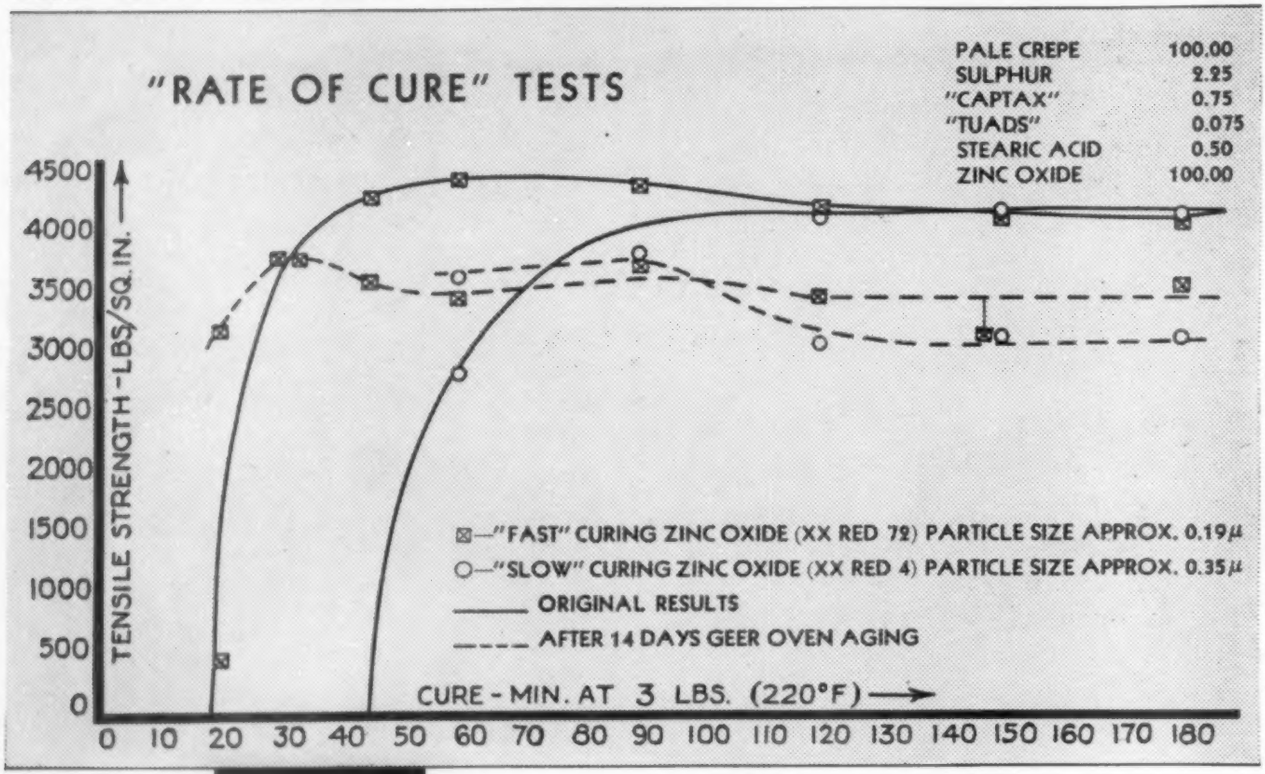
No. 13

of a series of charts showing a comparison of "fast" and "slow" curing zinc oxides with typical accelerators.

THE ANTI-SCORCH PROPERTIES OF XX RED 4 ZINC OXIDE



Note: **At 220°F. measurable cures are obtained with XX Red 72 in 20 minutes in a Captax-Tuads compound, while there is no indication of "set up" with XX Red 4 until after 45 minutes. This experience has been duplicated in a practical way in the factory—stocks which could not be processed with XX Red 72 on account of scorching may be run with XX Red 4.**

New Jersey Zinc

The New Jersey Zinc Company

160 Front St.
New York

THE RUBBER AGE
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Vol. 32 MARCH, 1933 No. 10

NEED OF BUDGETS and Sales Forecasts

By STANLEY ROBERTS
Bowling Green Rubber Co., Toledo, Ohio

THE successful management of a manufacturing business depends very largely upon the analysis made of the sales situation and upon the translation of the resulting information into terms of factory product, raw material requirements, expenses, equipment, and the other factors of the budget.

Whether it is recognizable as such or not, every business must have a sales forecast in some form or other. It may be in the form of elaborate quotas, or detailed statistics. It may even be altogether invisible, yet definitely implied and assumed in the production schedule which is in effect. No manufacturing, purchasing, financial or other plans can be intelligently prepared without some idea of the prospective sales. Obviously, the more complete and accurate this information is, the more helpful it will be to the management that uses it.

It is no longer sufficient to say that business is good and that production will accordingly be increased, or that the outlook is poor and that production will therefore be curtailed. In most cases it is necessary for each business to arrange a specific routine for gathering its own special data and for converting it into forms that have a definite meaning to its various departments.

It is necessary to determine what factors affect sales and then set about measuring these factors by a regular and systematic procedure. One business may be affected by the growth of population, another by the weather, and hundreds of other uncontrollable factors or combinations of them, may be responsible for changes.

Such controllable factors as design, price, advertising, location, freight rates, service, and so on may have important bearing upon the outlook. It may also be necessary to consider the effect of such factors as affiliations, consolidations, control, financial backing, and the like. Some factors are slow in taking effect; others may be felt suddenly.

It is quite apparent from the above why no single brain, however active, is sufficient to register and act upon the influence of all such factors and their various complicated ramifications. Some plan must be devised for reducing all these things to terms which can be understood and treated in a more or less routine manner.

Responsibility in Sales Department

Such a plan can be handled best by the sales organization. The responsibility of the sales organization is not over until it has virtually placed a requisition with the factory for its requirements for a certain period in the future, depending upon the nature of the product and its manufacturing cycle.

The essentials for proper sales forecasting are:

(1) Adequate sales statistics as a basis for the estimates; (2) A clear understanding of the information needed for the manufacturing forecasts; (3) Actual comparative figures immediately after the close of each period; (4) Regular use of forecasts for control of operations; (5) The sales manager must be "sold" on the budget and must "sell" it to his organization.

Sales records may include information ranging from simple sales reports to the research work of a private sta-

tistical organization. Most of such data was found to exist only in the heads of various individuals and one of the first steps was, therefore, to organize this material and to reduce it to the form of permanent records that would be adequate without being bulky, burdensome, or expensive.

The form of the sales forecast depends upon the information required by the manufacturing division. Besides quantities, the manufacturing managers needed such information as grades, brands, colors, modes, packages, and so on, and provision had to be made for incorporating it in the sales forecasts so as to furnish the basis for the manufacturing forecast.

Check on Estimates Necessary

Accounting information is seldom available in exactly the form needed to make correct comparisons with the forecasts. A subsequent check on the estimates is indispensable. It is most valuable when made while the subject is fresh and while the resulting information can still be utilized. It proved much better to have the accounting revised to fit the forecasts, rather than to resort to forecasts of a makeshift nature in order to save a little accounting effort.

Unless the sales forecast is tied in with the preparation of the operating program, it is not to be expected that it will command the respect and serious consideration that it should have. The forecast that is really worth while preparing should be a most essential part of any general plan of management which is guided by a budget instead of by uncoordinated guesswork.

A determined management, of course, can force the preparation of the sales forecast even on an unwilling and unbelieving sales organization. Occasionally this may be necessary, but, under ordinary conditions, it is far better to sell the idea first. Otherwise it is apt to become a great time consumer and a most convenient alibi.

It is probably worth while to plan answers to objections before trying to sell an idea. The following objections to a forecast are sometimes heard: (1) that it consumes salesmen's time; (2) that it is only a guess anyway; (3) that the situation changes constantly; (4) that the forecast is not always followed.

Management of sales is like the management of an army. The thing that counts is the attainment of the objective. It matters not whether 10 or 50 per cent of the effort be spent in planning as compared with execution. No one will dispute the value of contact with consumers; but neither will anyone argue against the advantage of making deliveries when promised; of having the right designs, styles, and the like; of being able to compete in terms of price and service; and of having stability of organization.

Worth the Salesmen's Time

If the forecast materially aids in these things, and in the coordinating of advertising, sales promotion, production, in making service and distribution available in assuring adequacy, wthout surplus, of product where and when desired, then it is worth the diversion, if necessary, of a considerable amount of salesmen's time. Actually, after the functioning of the scheme had been reduced to routine, this loss was scarcely noticeable. In the long run it resulted in more sales per dollars of cost. These were the objectives.

All forecasts are guesses. No one expects them to be 100 per cent accurate, but it is necessary that the estimates be made thoughtfully and in the light of the best information obtainable. Experience has shown that accuracy has been improved, but extreme accuracy is far less important than the control, the knowledge of causes of changes in the outlook, and the operating plan which was subsequently developed.

The more the sales pictures changed, the more necessary it became to have the best possible information on average and peak requirements and the most advanced notice of expected changes. If there were no changes, budgets would not be required at all. Changes are arguments for forecasts, not against them.

The sales organization has to learn that the final budget program may be quite opposed to the original forecasts and yet be decidedly to the interest of the general cause. Sometimes increase in sales were demanded which seemed unreasonable, if not unsound. Sometimes it proved advisable to forego sales rather than to increase investment or to force competitor retaliation.

The actual opposition was due primarily to the fact that forecasts automatically become standards by which performance is judged. If the forecasts do not state specifically the sales requirements, the factory cannot be expected to produce the proper amount. On the other hand, having made definite commitments regarding sales expectations, it is only natural that results should be compared with such standards by the management.

Capitalizing the Forecasts

The experienced sales manager, of the true executive type, will seize upon the advantages of the forecasts and capitalize for his own use the very elements to which others, either consciously or unconsciously might object. In one instance a sales forecast came into its own through a shortage of merchandise which developed solely because a pronounced increase in the demand for one product had not been properly anticipated. The sales manager complained. Orders could not be filled and he tried frantically to get the factory to produce, only to find that sufficient materials were not available and could not be procured in time. He found that the purchasing schedules had been met but that the factory had not indicated any increased demand for the needed material. It dawned upon him that the matter had been entirely within his own control.

It would only have been necessary for him to have foreseen the conditions and to have put it in his forecast in time for materials to have been ordered and for the product to have been manufactured. He saw then that he had not yet learned to use the forecast.

At one time, for a special situation, it was found necessary to consider actual absorption of product by consumers. To this end sales representatives were required to supply: (1) actual figures of the stock at all points not yet in consumers' hands; (2) forecast of expected sales to consumers each month; and (3) a forecast of what they considered to be the proper stocks to carry at each point each month to meet the expected sales. Upon receipt and scrutiny of this information the company sales—or shipments—were quickly calculated."

Preparation of Samples for William's Plastometer

PLASTICITY test samples of uncured rubber compounds of uniform size may be produced by means of two small portable hand arbors. One, which is small enough to be placed in the oven with the plastometer, consists of two parallel metal plates enclosed in a frame, and is arranged to squeeze a flat disc of compound to uniform gauge. The other arbor consists of a small spherical hand screw operated mold, for cutting spherical pellets from the hot pressed disc.—*R. R. Olin Laboratories, Akron, Ohio.*

The Outlook for Rubber

Eric Miller Expects New Fields to Open Up Possibilities of Increase in Consumption, But First Competition of Native Rubber Must Be Met By Decreased Production Cost on Plantations.

By ERIC MILLER

Chairman, Harrison & Crossfields, London, England

IT is estimated that the area under rubber in the East today amounts to nearly 8,000,000 acres, of which just over 6,000,000 acres are tappable, though not all being tapped at present. In three to four years' time practically the whole area will have reached the tappable stage. The area planted on large estates amounts to 4,250,000 acres, of which all but half a million acres are owned and managed by Europeans (including Americans). The area in small native holdings is estimated to be about 3,750,000 acres. Extensions have been slowing down since 1927, and since 1931 have practically ceased. No substantial further extensions are likely to be made until we have a profitable price for the commodity.

The output of rubber during 1932 amounted to about 715,000 tons. With a price of, say, 6d. a pound, it might possibly have reached 950,000 tons, but such a price could be maintained only if consumption were about equal to production.

Operating at Loss

Practically every estate is producing at a loss, which is being met out of reserves accumulated during past years. The immediate problem facing most estate producers is how long their reserves will last. With native rubber the case is different. In Malaya a large proportion of the native producers are entirely dependent on their rubber; but in the Netherlands East Indies most of them grow their own foodstuffs, and while prices are low, tapping there is confined to the owner and family in the more accessible districts.

The gap between potential production at 6d. a pound and actual production during 1932 was greater for native than for estate rubber; but, if the price rises, tapping will probably be resumed on some of the estate areas now being rested, and more remote native holdings will quickly come into production.

The absorption of rubber was expanding at an average rate of over 11 per cent per annum between 1920 and 1929, when it had reached 790,000 tons. By 1932 it had fallen to under 670,000 tons. The United States absorption fell from 470,000 tons in 1929 to 313,000 tons in 1932, while that of the rest of the world during the same period increased from 320,000 tons to nearly 355,000 tons. The stability of the absorption of these other countries during 1930 and 1931 and its increase during 1932—the worst year of the depression—is probably the most hopeful factor in the situation today.

Even in the United States there are possibilities of specific improvement. Eighty per cent of the absorption of that country goes into automobile tires and tubes. Gasoline consumption there—a fair index of the wear and tear consumption of rubber—increased steadily until 1932; in that year it declined only 9 per cent from 1931, and that mainly in the summer months. Tire stocks both in the hands of manufacturers and dealers have been greatly reduced, and the average condition of tires on cars is believed to be poor; but, on the other hand, stocks of crude rubber in the United States are nearly 400,000 tons.

When trade revives, a considerable increase can be looked for in the demand for rubber both for motor transport and for other uses. New uses are steadily being discovered, and through the research and propaganda now being carried out, an increase in the consumption in new directions can be confidently anticipated, thus giving greater stability to demand. It is impossible to put a limit to the potentialities of a material possessing the unique properties of rubber, in its ordinary form or as latex; and for this reason many of us believe that a comprehensive scheme for regulating supplies and putting the industry on a solid basis would confer great benefits on producers, manufacturers, consumers, as well as the governments of the various producing countries, who are very definitely interested in its welfare.

Turning now to the more distant future, the most uncertain factor is that of native production in competition with estates. The advantage possessed by the estate over the native is the estate's organizing ability, and the power to apply the results of scientific research and of technical improvements both to producing rubber in a form which is more suitable for the manufacture of rubber goods, and to reducing the cost of production by adopting better methods of planting and cultivation.

Reduction in Expense Needed

Before crude rubber as ordinarily prepared for the market can be turned into rubber goods, much expenditure on labor, power and machining is required, which adds materially to the cost of the finished article. A probable development in which well-equipped estates alone would be able to participate may well be the preparation of the rubber in such a form that the expense of "breaking it down" for manufacturing processes could be drastically reduced. Development on these lines is already receiving serious attention, and will probably be beyond the capacity of the small native producer.

Any permanent reduction in estate costs of production must necessarily largely depend on increasing the yield per acre. Much has already been accomplished in this direc-

(*Continued on page* 377)

Use of Rubber in "AUTOTRAM" Cushion Wheel

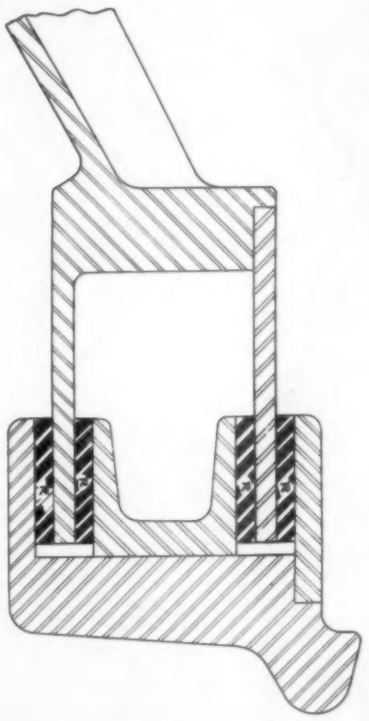
By C. W. BEDFORD

Tire Development Engineer,
The B. F. Goodrich Rubber Company, Akron, Ohio.

THE desire to rubberize railroad wheel equipment dates back over fifty years. The patent office archives disclose that an unbelievable amount of time, energy and money have been spent on the problem of the cushion wheel, which has even recently been publicly described as "foredoomed to failure, for the bearing capacity of rubber is slight compared with that of metal."

Yet, out of the chaos of many failures there has come a new type of cushion wheel, developed by engineers of the Clark Equipment Company of Battle Creek, Mich., and The B. F. Goodrich Company, Akron, Ohio, now operating on the "Autotram" of the Clark Equipment Company, which introduces engineering principles, new in this application and which seems to be the long sought answer for a quiet running railway cushion wheel.

In the Autotram cushion wheels, multiple soft rubber inserts, adjacent to the outer circumference are installed in a preloaded condition and carry the load, as well as traction or braking effort, entirely by shear distortion. These inserts are so disposed that all of the rubber in the wheel carries its full share of the load at all times. The rubber in the upper half of the wheel supports as much load as the rubber in the lower half, thereby doubling the efficiency of the installation as compared with the many previous types of wheel where the load was only supported by compression of rubber in the lower half of the wheel.



Cross-Section of Portion of Autotram Wheel Showing Location of Rubber

Support Load of 4,200 Pounds Each

Under shear loading of less than 10 lbs. per sq. in., these Clark-Goodrich cushion wheels easily support a load of 4200 lbs. per wheel in the present installation and may be easily designed for loads up to 12,000 lbs. per wheel or even higher. Here we have, for the first time, a rubberized car wheel that offers but little limitation to total car weight as is the case with solid or pneumatic tires. The well known limitation of rubberized wheels is still present, however, in that braking effort may not be applied to the rims of the wheels. The high temperature developed by brake shoes quickly destroys any rubber in the wheels.

One of the outstanding features of the Clark-Goodrich cushion wheel is its ability to give continuous performance at high speeds. In order to picture the difficulties which have been overcome in this respect, it may be said that one revolution of this cushion wheel is the equivalent of four load flexings of the rubber. If at a speed of 90 miles per hour the wheel makes 1,000 revolutions per minute, this is equivalent to 4,000 stationary loadings on the rubber per minute. At this high rate of flexing, considerable heat is generated in rubber and must be quickly dissipated as otherwise the internal temperature of the rubber will soon reach the point of decomposition. This is the cause of the "solid tire blow-out." It is comparatively easy to provide a pneumatic tire or a cushion wheel to function under easy loads and, at speeds up to 60 miles per hour. Higher loads plus higher speeds present the greatest problem in a rubberized wheel. The new Clark-Goodrich cushion wheel is designed for less than a 10° F. rise in temperature at high speeds in a hot climate with design modifications to carry almost any desired load.

As a related factor to heat generation, the radial deflection is maintained at a low figure. The less the distortion, the less the heat generated in the rubber. It is for this important reason that the rubber inserts are preloaded by lateral compression as the wheel is assembled. By this means, the soft flexing stage of rubber is removed with the result that on application of load or additional impact this rubber instantaneously reacts with its full load carrying capacity.

Soft rubber stiffened by compression is much superior to rubber heavily compounded or tightly vulcanized to attain the same stiffness without compression. This superiority is evidenced by the lower amount of heat generated

per flexure, a small item in one flexure but it amounts to the difference between success and failure at a large number of flexures per minute.

The Clark-Goodrich cushion wheel is designed for extended service without continuous further attention. There need be no high pressure air stations or servicing crews scattered along the railroad right-of-way. To avoid mechanical failures, not only is the load application per square inch kept at a low figure but further freedom from trouble is provided by the special feature of partial release of load application at the edges of the rubber where failures are most likely to start. Assembly of the wheel is so designed that the edges of the rubber inserts carry less load per square inch than the main body of the rubber, thereby relieving the stresses at the most vulnerable points.

Why Pneumatic Tires Were Not Used

The question is often asked as to why pneumatic tires were not used on the Clark Autotram. In partial answer, the following items may be considered: The Clark Autotram is designed for main line traffic and must operate the traffic signal system. With pneumatic tires this has only been accomplished by the very unsatisfactory method of dragging shoes or brushes on the rails.

With the Clark-Goodrich cushion wheel, the wheel rim is already insulated from the wheel disk and axle so that the rims themselves are used for rail contacts. By an auxiliary carrier-current supplied from the car, the contact resistance of wheel on rail is broken down and the regular signal system is allowed to function normally.

Further in regard to pneumatic tires, the narrow rail head offers a definite limitation to tire carrying capacity. Speed added to load greatly augments the pneumatic tire problem such as to make it inadvisable at the present time to equip the Autotram with such tires. The data which has led to this decision has been obtained by actual tests, with many tires having been run to destruction on an indoor tire testing machine that operates the tire on a rotating 3-inch rail head.

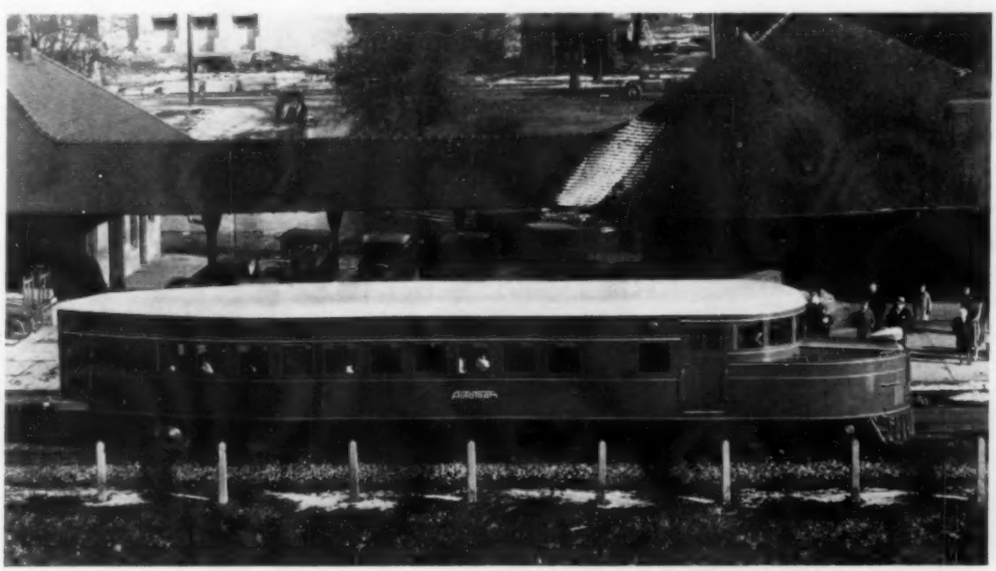
The effects of inflation pressure, load, speed, tire sizes, and tire construction have been thoroughly studied by actual service tests. Surprising improvements have, thereby, been made in pneumatic rail tires, but to date they have appeared insufficient to warrant the following items:

1. Increased number of wheels.
2. Use of dragging brushes or shoes to operate traffic signals.
3. Installation of high pressure air supply on car or at stations.
4. Maintenance of service crews at intervals along the right-of-way.
5. High speed limitations.
6. Necessity of decreasing the air volume of the tire by placing a riding rib inside the casing to function after deflation.
7. Frequent inspection of tire inflations.

The three main functions of a pneumatic tire are to iron out unevenness in the road surface (smooth riding), to give quiet operation and to give quick starting and stopping. On a rail the surface is already smoothed out, so the cushioning effect of the tire is far less important than on a public highway for trackless vibrations on curves, rail joints and crossings. It does not, however, provide that quick start and stop of the highway automobile nor is this necessary with a light weight rail car. The lighter weight of the car in itself removes a large percentage of the momentum storage of the heavy standard railway equipment and so speeds up the time required for starting and stopping that there is much less advantage left for the claims of the pneumatic tire.

There is also a definite low weight limitation for self-propelled, rubber-wheeled rail coaches in the load required to force the wheel flanges through spring frogs and frozen road crossings without derailment or curtailment of speed. The design engineer has found himself between two seemingly unsurmountable limitations.

Pneumatic rail tires will carry only so much load at low speeds and still less load at high speeds so the total car weight must be kept as low as possible, yet the too light car will not operate on main line traffic through frogs and frozen crossings. The Autotram cushion wheel is the answer in our estimation. The wheels place no limitation on car weight, although they require a new design of braking equipment. They carry the standard railroad rim and flange contour. They require little servicing and give long service. They do not limit speed. They appear to be the future type of rail car wheels for railroads, elevated cars, and street cars.



Autotram at Battle Creek Station of Michigan Central

Description of AUTOTRAM RAIL CAR

Rubber Is Used in Wheels, Step Plates, Window Channels, Under Floor Rugs, for Body Insulation and Under Power Units

THE "Autotram" is a new railroad vehicle in which principles of automotive design have been applied to railroad needs. It is in fact an automobile built for use by railways, on their main lines, in the hope that it may enable them to supply faster and more frequent passenger service at lower cost.

The drive of the Autotram, while purely of an automotive type, differs greatly from that of the standard automotive vehicle built for highway use. There is no chassis in the automotive sense of the word but in its place there are two trucks upon which the body is carried in a manner similar to the standard railroad car.

In the front end of the vehicle is a power compartment containing not only the main driving engine but also certain auxiliary units. The driving engine is a high speed 16 cylinder gasoline engine of the V-type. Tractive effort is supplied to the wheels from the engine through a series of sturdy units designed for the purpose and adapted to the peculiar necessities of the vehicle. Means are provided to convey the tractive effort from the rigid body to the swiveling trucks as the vehicle rounds curves. All driving is done on the forward truck which is equipped with two pairs of wheels, each driven by a specially designed automotive axle. The rear truck is a trailing truck. Means are provided to permit side slipping of the wheels as is usual in railroad vehicles. Braking is accomplished on all wheels of both trucks. Brakes are of the automotive type rather than of the railroad type. They are internal expanding hydraulically operated, but controlled by air from the engineer's cab.

Tires May Be Used Later

The design of the trucks is such that rubber-tired wheels may be used if and when tire development will permit. The vehicle as at present built is equipped with steel-tired wheels, the contour of the rims being of the standard railroad specification. Much attention has been given to the design of these wheels. They are so built as to include rubber to provide cushioning and resiliency and yet to conform to railroad standards. The design is such as not only to be resilient but also to insulate the car body against the noise generated by the wheels rolling on the rails.

Rubber has been used liberally throughout the vehicle to insulate against noise and to prevent vibration. Not only are all power units mounted on rubber in such a way as to avoid metal to metal contact, but the body itself is rubber mounted on the trucks, and the wheels contain rubber between the tires and hubs. The result is to promote quietness and to prevent vibration of the car while in operation. Except for the liberal use of rubber throughout the structure of this car the qualities desired by its designers could not have been obtained.

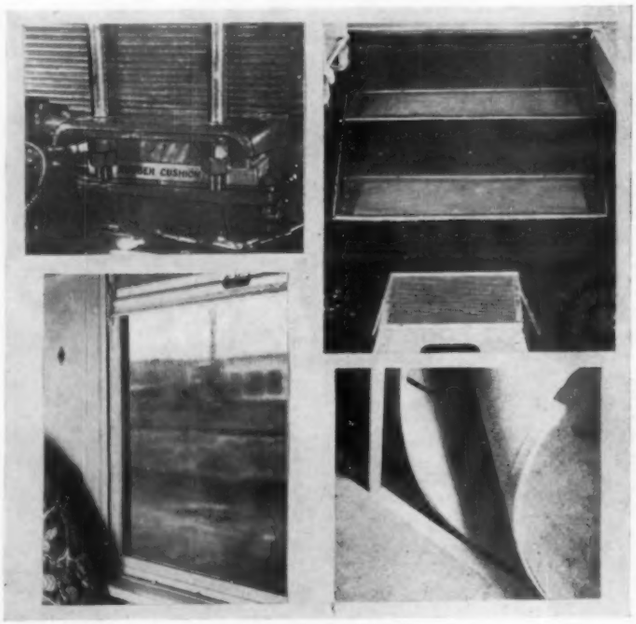
The body is of aluminum construction throughout. In most places an aluminum alloy called Duralumin is used, and all pieces are heat-treated before use. Duralumin is especially suitable for the purpose of this vehicle, not only because of its lightness but because of its quality of yielding rather than shattering under shock. The fabrication of the body utilizes a large number of sections, many standard and many special. Aluminum, because it permits of extrusion, may easily be formed into special sections which lend themselves readily to construction purposes.

These aluminum alloy structural members have the strength of mild steel although only one-third as heavy.

The body is of what is known as the centersill type; that is to say it has a strong beam under the floor extending from end to end to give strength longitudinally. While the Autotram is not intended to be operated in trains, still it has the buffer capacity, that is to say the strength longitudinally to permit its use in trains if so desired.

The vehicle is approximately sixty feet long. It is of

(*Continued on page* 381)



RUBBER IN THE AUTOTRAM

Upper Left: Rubber Pad used where aluminum panels are fastened to car frame to insulate against squeaks and noises.

Lower Left: Double grooved channel rubber used for tight seal of double windows.

Upper Right: Rubber Step Tread molded to metal back. Makes tread safe, renewable, wear-resistant and silent.

Lower Right: Sponge Rubber, 3/8 inch thick used under carpet. Reduces noise and gives added comfort.

RUBBER FOOTWEAR —From 1882 to 1932

The following interesting account of the importance of rubber footwear was compiled from the files of "Boot and Shoe Recorder" and appeared in the Golden Anniversary issue of that publication in December. We are indebted to that Journal for permission to reprint the article for the information of our readers.—EDITOR.

MEASURING fifty years of progress in the rubber industry, rapid developments mark a period of improvements, not only in footwear, but other contributions in manufacturing processes and materials were made that are equally important. Rubber footwear in the first period of the fifty year cycle was more advanced (in comparison with the same products of today) than was the shoe industry.

In 1882 rubbers, boots and artics, eliminating refinements in design, construction and improvement in quality, differed little in general appearance from the same type of merchandise of today. The one buckle artic of today could not deny the parentage of its early relation.

Among the first attempts to lengthen the wearing qualities of rubbers, was a metal heel plate "fastened to the rear portion of the heel of the rubber boot or shoe, that part which is always the first to give out. It is well known that no matter how good may be the quality of rubber, the sharpness of the edge of the heel of the boot or shoe over which it is worn will in a short time cut through."

The problems of the merchant were as complex as at present, with the complaint "that one fault to be found at the present time with the dry goods stores in large cities which were dabbling in ladies' and children's shoes, is the fact that they are retailing rubber shoes at the actual cost. This compels the legitimate trade to do likewise and destroys all profit." Thus we take the first step up the path of progress in this vast industry, with invention going forward and distribution encountering obstacles.

An important buckle patent for artics and lumberman's boots was announced in '85 by Judson L. Thomson, sole manufacturer. The Lycoming Rubber Company of Williamsport, Pa., and the American Rubber Company of Boston, Mass., were among the first manufacturers in the early "Eighties," to exploit their products.

Attaching almost any type of gadget to rubbers was prevalent. "Something new" was a statement made by B. C. Tillinghast of Philadelphia, Pa., who adds: "The patent is an anti-slipping rubber shoe. An ordinary rubber shoe with steel points, keeping the foot dry and preventing the slipping on the ice." Other ingenious devices were continuously being patented, with the inventive mind enjoying a field holiday. Vast improvements are observed when we reach 1888—with the introduction of the two buckle arctic and the improved Congress ankle-boots. This group of manufacturers was making a strong appeal for the retail business: The Boston Rubber Co., L. Candee & Co., Woonsocket Rubber Co., Hayward Rubber Co., Goodyear's M. R. Shoe Co., (Wales Goodyear), American Rubber Co., Para Rubber Co., National Rubber Co., New Jersey Rubber Co., Lycoming Rubber Co., Lambertville Rubber Co., Union India Rubber Co., Goodyear Rubber Co., Ray Rubber Co., L. B. Smith Rubber Co.

Rubbers were made in many grades and under numerous names. Some of the classifications were: "Factory brands," "second grade brand," "special brands" and "orphan brands." The latter named was described as "the brands named are not reported by any factory as their product either as firsts, seconds or thirds."

Confusion in Retailing

Confusion existed in the retailing of rubber footwear. Policies evidently were unknown and merchant education was not considered significant. We read: "It is doubtful which is the worst policy—to overstate the merits of the goods for sale and so raise the expectations which cannot be realized—or to underestimate their merits by assuring customers that 'no rubbers are good for anything' and so destroying the confidence of customers in really good brands which the retailer offers at a price too near the cost."

Canvas-top rubber soled footwear was in prominence at this time, with such styles as rubber soled bicycle oxfords, men's and ladies' tennis oxfords, "seashore shoes," and one pattern appropriately termed "a man's vacation shoe." The patterns were more elaborate than we know them today.

Much discussion during this period was taking place regarding the formation of a rubber trust. Later in the year events record this fact. "If the Recorder had been in the 'prophet business' it could not have more accurately sensed the disposition of the people of the country toward all trusts and monopolies; now that they are thoroughly awakened on the subject, such restrictive legislative enactments have been proposed and will be agreed to as will regulate all 'Trusts' to the shades of innocuous desuetude."

The success of the rubber footwear season differed very little from the problems which confront the business today. The Candee Rubber Co., say in the early part of 1890: "What we want to make our business brisk is cold, snowy weather that will use up the goods now in the market." While galoshes were not known in those days, some merchants were of the opinion that there was a place for this type of shoe.

"This is rubber day," said a Chicago merchant as he pulled out a huge drawer filled with neat blue-lined rubbers or "gums" as Philadelphians called them and proceeded to fit a pair upon a lady's foot.

"Look at that young lady," he continued, pointing to a girl who was industriously tugging at the straps of a pair of rubber boots much in the manner of her little brother. "She's a sensible girl," remarked the merchant after he finished the sale. "Why shouldn't a lady wear boots in muddy weather, the same as a gentleman?"

Discounts Were Agitated

Discounts were constantly being agitated in the "Gay Nineties." Price confusion raged in the industry, with changes taking place and protests being made by the merchants. Discounts offered in 1890 were: "Commencing April 1 the discount will be 38 and 6 per cent off the regular price list. This is equivalent to a single discount of 41.72 per cent off. The present discounts are 45 and 5 per cent off equals a single discount of 47.75 per cent, so that the net advance is 6.03 per cent. It is generally admitted that this advancement is hardly sufficient to cover the increased cost of production."

Tennis shoes were being improved in style and construction and a ventilated type was exploited as an innovation. Heavy duck varieties were popular but a style note was injected into the oxfords and balmorals which could be bought in plaid, brown and white.

Fitting qualities were not as perfect as the rubbers of today. One large company was marketing a new "holdfast" rubber for ladies and misses that had "an appliance to prevent ladies, misses and children's shoes from slipping off the feet." It was attached to the back part of the rubber and strapped across the instep.

A bathing shoe with three bow ties and tongue was a daring adventure of the rubber industry at this period. Up to this time, bathing shoes had not been promoted.

In 1895 prices were raised but contributing factors such as increased consumption of rubber "used in the manufacture of bicycle and wagon tiring" were advanced as reasons for higher prices. New lasts were adding to the costs of making rubbers. We were in a period of pointed toe shoes and rubbers were improved to the extent that manufacturers were conforming their footwear to the lasts of leather shoes. "Formerly a shoe was a shoe and a rubber a rubber. Now shoes came in every variety of form—broad, narrow with round toe, pointed toe, needle toe—and the rubbers must fit them. This demand for a great variety in the fashions of rubbers, has materially increased the cost of manufacturing."

A molded rubber was announced as "all in one piece" with "no seams, no lining, no weak spots." A sample pair cost in women's—$1.00 and men's $1.25. More styles were yet to be seen before this year passed—with a three buckle galosh for women making its bow to meet the requirements of the pointed toe last and the new interest in style. Footwear protection and health advantages were attracting women's patronage. The notch at the back of men's rubbers for placing the free foot on the rubber to remove it, was also being emphasized as having sales advantages.

Fitting qualities were now being stressed by the industry. Manufacturers were having difficulties in keeping abreast of the style changes in women's shoes and retailers were being warned: "The mills are even more dependent upon early orders this year, than ever before, because of the great increase in the number of difficult styles and shapes. The rubber must fit the shoe and must closely follow the fashion of the prevailing shape. Orders for rubbers should be placed at the same time they order leather goods."

Approaching the twentieth century, we were to see the rubber industry expand its usefulness to the shoe industry with the invention of the rubber heel, to be shortly followed with rubber soles for leather footwear. Health values of rubber heels were the first appeals in this field. Rubber heels, it was declared, "are to prevent the jar of the body, save the strength, ease the nerves, outwear leather heels, resilient." Little did anyone realize at that time the tremendous production that was to be attained from this small beginning of the rubber heel. Rubber soles were being experimented with in attaching them to soles or leather shoes.

The definite improvement observed in the rubber footwear business was the rolled edge sandal four buckle arctic and hip boot—all new products of the early twentieth century. Women's rubbers were being made in various heel heights which was a forward movement of the industry. A new policy of going direct to the retail trade was announced by some manufacturers. This occurred about 1905. Progress was rapid but little change was to be noted

Style of Advertising Used

American Rubber Co.
R. D. EVANS, President, 59 & 61 Franklin st., BOSTON.
The American Rubber Co. makes a greater variety of Clothing than any other Company in the United States.
The American Clothing is conceded to be the best in the United States.
Manufacturers of strictly FIRST QUALITY
BOOTS and SHOES.
Are not liable to Break, Crack, or Tear; cannot be excelled for Beauty and Style, and are
Perfect Fitting.
American Boots and Shoes
HAVE ALREADY GAINED A
SPLENDID REPUTATION.
We can furnish Goods with "Crescent" Heel Plates.

An advertisement of 1883 illustrating the products of that period. Compared with similar rubbers of today, little change can be detected in the general outside appearance

in outside appearances of footwear. Sizes and lasts had a new meaning to the manufacturers, which brought about better fitting products. Fit became an important word through the industry and the retail shoe trade quickly seized the opportunity of merchandising their rubbers by exploiting these features. Finishes were not stressed in the selling appeal of the merchandise of this day.

The year 1910 opened with prosperous business. "The United States Rubber Company claims that this will be the best year in its history and the same can be said of almost every independent company. The latter have good orders on their books."

The practical use of rubbers was an approach to new selling ideas. Mothers were advised to keep their children's feet dry with rubbers. "No child should be allowed to go out in the snow or when walking is wet, without rubbers."

Composition Soles Introduced

The most important development of the following two years, up to the period when we entered the World War in 1917, was an announcement by two of the largest manufacturers of composition soles. These were promoted with vigor and shoe manufacturers and retailers viewed this new sole material with concern, as leather prices were on the upward trend and a substitute for soles was something to be considered. Shoe manufacturers were featuring lines with these new soles with equal durability of leather.

The shoe merchant was becoming more and more interested in crepe sole canvass top footwear. Shoes of this type were popular with parents and children alike. The demand growing and supplanting many pairs of leather shoes worn during vacation. Sports footwear was another vogue increasing the use of crepe soles. Not all the early experiments in attaching them to leather shoes were satisfactory. This was a new venture by shoe manufacturers. Eventually the difficulties were mastered and the acceptance of this new bottom construction had been established.

The college influence had some effect in hastening the introduction of galoshes with patent fasteners. The four-buckle artics were being worn by "Betty Co-ed"—cuff turned down and the buckles unfastened, with part of the galosh flopping in all directions. It was a fad and was being adopted by girls throughout the country.

In 1924 and 1925 galoshes with patented fasteners made their appearance, followed quickly with other new and different types. The industry was involved in bringing out some kind of galosh to meet the sudden acceptance of a new product designed to protect footwear and feet. Women discovered that warmth was a new thrill in wearing galoshes and their practical use soon became a positive winter accessory that was necessary in the complete footwear wardrobe.

Russian boots had a fling in the leather shoe field to be followed by a rubber boot similar in design. This vogue was short lived, however.

All types of this new vogue were being brought out. Button fasteners, snap devices and other trick fastening arrangements of galoshes all came on the market with a burst of promotion. The rapid swing upward in this field is so recent that little need be added in this review of the industry. Style was now a factor to be dealt with.

Additional betterments were being made in lasts and heel heights and sizes reached their most advanced stage. Going into the fiftieth year of progress, galoshes had not exhausted their possibilities. Finishes and simulations of leather materials were being placed on the market.

Dull surfaces and suede effects in rubbers, to coordinate the fashion of leather footwear, caused some astonishment in the trade when the new lines were introduced.

These new features removed barriers and opened up new horizons, silencing those who scoffed at the idea that many advancements would be made in the next march of progress.

Invisible fasteners were but another construction feature to meet the approval of the fair sex. One large firm designed a galosh without fasteners, that slipped over the shoe. Outstanding achievement in the industry during this latter period was being accomplished.

Beach sandals and outdoor footwear came along with a rush and many pairs were supplying the wants of the customers who formerly bought leather shoes to be used for a similar purpose.

Rubber had dropped in price and the quality of the footwear produced during the last year (1932) was proclaimed by manufacturers to be the best possible. Pure rubber was more economical to use than substitutes and once again the customer was benefited by receiving the greatest values yet known in the business.

In climaxing a story of an industry that has grown to the proportions of the rubber footwear business, the imagination has not been developed sufficiently to leap into the future and encompass what progress can be expected in the next fifty years. We know its direction will be forward and its vision set upon a goal of achievement surpassing all efforts of the past.

Outlook For Rubber

(Continued from page 371)

tion by more scientific cultivation and the extensions made with selected high yielding material. The acute depression through which the industry has been passing during the last two or three years, enforced many economies, some of which may be permanent. But the abnormally low price at which rice—the staple food of the East—has been available, and the depressed condition of most other industries, are responsible for the reduction in labor wages to an extent which is not likely to be maintained. Publicity has recently been given to the idea of introducing "forestry" methods on estates to reduce the cost of upkeep while conserving soil and creating better humus renewal, thus increasing the yield and finally diminishing the cost of production. In an unscientific way such methods have been applied by the natives to their holdings, but whether they can be safely adopted in the existing estate area is a question which is not yet definitely decided.

Viewing prospects as seen from the depths of a depression from which we have scarcely begun to emerge, and from which the rate of emergence seems likely to be slow, the road which the rubber producer has to travel looks long and dreary. But when we reflect that twenty years ago the consumption of rubber was only about one-seventh of what it was even in the depressed year of 1932, and that for many purposes the use of rubber is still in its infancy, we may take a more hopeful view.

If only the public authorities would awaken to the fact that the next few years afford a unique opportunity for getting rubber roads laid in all our important cities at a cost as low as is ever likely to be possible, they would be conferring an immense boon on the dwellers in those cities by reducing noise and vibration, which are the curse of the age. Some of us have been urging this for more years than we care to remember, but the time has never been so propitious as it is now, from every point of view. Why delay?

Liberalization of Anti-Trust Laws Asked to Meet Tire Price Evils

A Statement by P. L. LITCHFIELD
Goodyear Tire & Rubber Co., Akron, Ohio

Appearing before the Senate Committee on Finance on February 21st, which was seeking ideas from the "best minds" of the country to help cure the depression, P. L. Litchfield gave his views on the causes of and remedies for the depression. Included in his recommendations was the very pertinent statement that a solution of the price cutting evils in the tire industry was possible by a change or liberalization of the Sherman Anti-Trust Laws to permit manufacturers to set fair prices by group agreement. In answer to a question on this phase of his statement, Mr. Litchfield said that "modification (of the anti-trust laws) in line with modern business methods would compel a minority of one or two in the industry to abide by agreements sanctioned by federal law." We believe our readers will be interested in the complete statement of Mr. Litchfield, which appears below. (Editor)

Paul L. Litchfield

MAJOR causes of the depression might properly be lumped together under the embracing title of Extravagance. Following the war there was a gaping void created by four years of non-productivity on the part of the warring nations. To fill this void America's capacity to produce was stepped up enormously. Huge expenditures were made for additional facilities with which to meet the vastly but temporarily stimulated demand for our goods.

We erred in regarding this temporary situation as a new and permanent order. Producing more and more goods, paying more and more wages, we fancied we had attained a formula for a new prosperity which would never cease to grow. Senses of values were lost. The counsel of prudence was hooted.

In few words, we discounted the inexorable law of supply and demand. When export needs were satisfied, we continued to produce on the inflated scale, applied high pressure methods to our selling and stimulated domestic purchasing power through deferred payment plans. We used up current earning power and mortgaged that of the future.

By a series of loans to other nations we not only stimulated a false demand for our goods but gave the foreigner means to establish industries on bases competitive with our own. Thus we exported and lost both the money and the products. In our domestic credit losses, we at least retained the products within our own domain.

The inevitable day of reckoning came. Since the Fall of 1929, we have been engaged in the very painful process of paying for our mistakes.

Evils of Surplus

Since we attained dizzy heights of inflation it was inevitable that the reaction had to be severe. Unfortunately, the return to new, sane levels could not be accomplished in an orderly manner; we could not deflate uniformly. Our production capacity, remaining at high potential, the proven theory that unit costs are lowered as unit production is increased, the unwillingness to recognize that deflation must be general, all conspired to bring about a resistance to the forces of deflation. The result is that our economic machinery has been thrown completely out of gear. We are plagued by a great mass of surpluses. It is this situation which confronts us now—the problem of the surplus must be solved before we can start to build anew.

Our most perplexing and vital surplus, in my opinion, is the labor surplus. A great mass of potential workers, although willing and able to work, are idle. Our capacity to produce on the farm, in the mines and in the factories is far in excess of our needs.

Shorter Working Periods

There is no point to producing more than we can legitimately consume. To do so would be extravagantly wasteful. Therefore, it seems to follow naturally that the work necessary to supply current demands should be spread to the number of workers who are available. Only in this way can we absorb the labor surplus and restore some measure of purchasing power to the millions who are now idle and, therefore, out of the market for our products.

From the viewpoint of general welfare it is far better to have all of our workers employed 75 per cent of the time than to have 70 per cent or 80 per cent of our workers employed 100 per cent of the time.

I believe that for the period of the emergency there should be fixed a work-week limit of 30 hours for what are

classed as fatigue jobs and a limit of 40 hours for non-fatigue work. Ample flexibility should be allowed in agricultural work because of its seasonal nature.

Agricultural Relief

Farm surpluses should be reduced through some form of temporary subsidy which would include provision for bringing agricultural production into line with our needs.

Sound Currency

There should be no inflation of currency. Without sound money we cannot cure our economic ailments. I do, however, favor a reasonable expansion of credit controlled along the lines now followed by the Reconstruction Finance Corporation.

Unbearable Taxes

The present tax burden is not entirely necessary. All forms of tax spending should be sharply reduced. We cannot now afford the governmental luxuries built into our system during flush times. Sweeping elimination of all but the primary and essential activities of government appears to me to be mandatory unless we care to face dire and immediate consequences.

The vast sums now collected from all and turned over by an indulgent government to war veterans should be sharply reduced. I am not advising the withdrawal of relief for those who were actually injured by the war, but at that point we should stop.

The policy of singling out specific industries against which special taxes are levied is fraught with danger. In paying the special excise tax on tires for the last six months of 1932, Goodyear turned over to the Federal Government $2,260,000. We paid the government this sum, and yet there was no profit made for the stockholders who own the business. The automotive and allied industries are the particular target of the tax hunter.

A general manufacturer's sales tax is fair and scientific in principle. Such a method spreads the burden equitably. Where the income tax is a levy against thrift and initiative the general manufacturer's sales tax would be a levy on extravagance and ability to spend.

Foreign Debt

Reasonable downward adjustment of our loans to other nations is clearly indicated. In making such concessions, however, we should improve our status in the matter of export trade and we should also endeavor to promote the cause of international disarmament.

Selective Immigration

I believe that after we have obtained a good measure of recovery and the labor surplus is remedied, but before we have relaxed the suggested limits on working periods, we should encourage selective immigration. Only in this way can we step up the nation's consuming capacity and resume employment of some of our excess agricultural and manufacturing facilities.

New Industries

The government should extend a reasonable measure of encouragement to new industries which promise to improve the lot of mankind. I have particularly in mind the Zeppelin industry in America. In this case, large expenditures have been made for manufacturing and fabricating facilities, an efficient organization of builders has been assembled and trained. Two great airships have been built for the Navy. Similar vessels can be constructed for commercial operation between continents. This new industry offers complete safety and greatly increased speed in inter-continental hauling. The fact has been established that there is a definite place in the field of transportation for the giant airship and that it does not trespass upon or compete with existing methods. The commercial Zeppelin cannot compete with heavier-than-air lines in their realm of fast flights over land. Nor can the Zeppelin compete with the merchant marine in carrying heavy freight and large numbers of passengers. It can, however, offer a fast, de luxe passenger service and a means of transporting trade samples, fast express and fast mail because it reduces by 65 per cent the time now required for crossing the Atlantic. The very fact of increasing speed will stimulate trade and bring the peoples of the earth into better and more friendly relations.

To be commercially successful, the projected Zeppelin lines must be given the benefit of the postal contracts and the legal status America gives its merchant marine in other respects. Unless this legal status is given, through the passage of the McNary-Crosser Bill now before the Senate, Zeppelin plant facilities will lapse into idleness.

Laws That Hamper

Speaking from the viewpoint of the rubber industry (and I believe it applies to many other industries) certain Federal laws preclude any successful solution of the problem of destructive price cutting. Tires are now selling below production cost; workers and shareholders suffer. Were we permitted to establish fair and reasonable prices through group agreements, the best interests of the country, social and financial, would be served. I am not recommending the sacrifice of the public's rights to governmental protection against extortionate price fixing but merely that the Sherman and similar acts be liberalized to meet an especially acute evil. Unless there is some form of immediate relief extended, the tire industry and its employes face a bad situation.

Increased Presidential Power

In closing, this is not a time for consideration of selfish interests when they delay or make impossible the remedial steps which must be taken if we are to return to normal conditions. Our governmental machinery is too cumbersome to meet the immediate and rapidly changing situation. It is a time when quick, unhampered action is called for. I, therefore, urge that adequate latitude be given at once to the executive arm of our government to take such measures as are needed to meet the crisis which now exists.

Carbonex—Softener and Filler

CARBONEX* is a combined softener and filler containing approximately 42 per cent carbon and 58 per cent mineral wax or hydrocarbon. It has a melting point of about 215 deg. F. to 225 deg. F. It is put up in flake form in bags containing about 25 lbs. each.

Carbonex assists rubber compounds to withstand the action of acids, alkalis, oils, grease and gasoline, and it also adds heat-resisting properties. The leathering action of Carbonex in rubber makes it of particular value to shoe-tap manufacturers. Its great tear-resistance when the rubber compound is in a heated condition makes it equally attractive to tire manufacturers for use in air bags.

Because of its low gravity and low volume cost, it can be used to advantage in a large variety of mechanical goods. The Carbonex content may be varied within unusually wide limits, depending upon the type of compound desired. The proper amount to use in a black tap compound is 40 per cent to 50 per cent on the rubber content, whether the compound is of new or reclaimed rubber, or both.

Carbonex is of interest to rubber manufacturers of mechanical goods in general. It has great value in compounding heels, soles, taps, air bags, air hose, oil and gasoline hose, and valve discs. (The Barrett Company, New York, N. Y.)

*Reg. U. S. Pat. Off. by The Barrett Company.

ABSTRACTS of RUBBER PAPERS

To Be Presented at Division Meeting

Eleven Papers Will Be Given at March 28-29 Meeting To Be Held in Washington, D. C.

THE Spring Meeting of the Rubber Division, A. C. S., will be held in Washington, D. C., on Tuesday and Wednesday, March 28 and 29. The division dinner will be held at the Mayflower Hotel on Tuesday evening but the headquarters of the division will be at the Raleigh Hotel. Abstracts of the papers to be presented follow:

Low Sulfur Compounding—A. A. Somerville and W. F. Russell, R. T. Vanderbilt Co., New York.

Since the beginning of the rubber industry the sulfur dosages used on soft rubber have declined from 20% to 2 or 3% customary today. The decline is still under way, and present sulfur ratios may be considered high in comparison with what is actually required to produce satisfactory commercial vulcanization, viz., fractions of 1%.

Vulcanization with extremely low sulfur ratios, the use of selenium and tellurium as auxiliary vulcanizing materials and the proper type of acceleration required to "cure in" all the sulfur and produce satisfactory commercial results, are discussed. Comparative data, covering a large number of physical attributes, are shown for pure gum and gas black stocks compounded with 3% of sulfur on the one hand, and 0.3% and 1% (in the gas black stock) on the other.

The advantages of very low sulfur compounds are shown to be less tendency to scorch, better physical properties, better aging, higher resilience and lower power losses, less discoloration, greater resistance to hot solvents, greater abrasion resistance and less flex-cracking on aging; the disadvantages are higher set at low temperatures and reduced capacity to adhere to metals. It would seem probable that in the future compounding will be based largely on the use of very low sulfur ratios.

Reactions During Vulcanization—III. The Multiple-Accelerator Effect—H. C. Jones, New Jersey Zinc Co., Palmerton, Pa.

The mechanism of acceleration with a mixture of diphenylguanidine and mercaptobenzothiazole is influenced by the presence of fatty acids in the rubber compound. With an addition of a normal amount of fatty acid to the stock, the fatty acid solubilizes zinc oxide needed for activation, while the diphenylguanidine and mercaptobenzothiazole function as a mixed accelerator. When there is a deficiency of fatty acids in the stock, however, diphenylguanidine reacts directly with zinc oxide and now becomes an activator for the accelerator, mercaptobenzothiazole. A mixture of butyraldehyde aniline and mercaptobenzothiazole is influenced by fatyt acids in the same manner as diphenylguanidine and mercaptobenzothiazole.

Experiments with the rubber compounding ingredients in a benzene-methanol medium are in agreement with the observations noted for the rubber stocks. In the presence of hydrogen sulphide, which is essential for the accelerator reactions, increments of diphenylguanidine increase the amount of soluble zinc available for activation of mercaptobenzothiazole, while additions of mercaptobenzothiazole to a fixed amount of diphenylguanidine do not influence the soluble zinc content.

Within the limits investigated, the amount of soluble zinc available for reaction has a direct bearing on the ultimate tensile strength of diphenylguanidine and mercaptobenzothiazole stocks.

The Mechanism of the Aging of Rubber—Bernard L. Johnson and Frank K. Cameron, University of North Carolina.

The investigation attempts to follow the phenomena of aging in rubber by x-ray spectrographs, and to correlate the results with those hitherto obtained, especially solubility determinations. It has been found that the position of the characteristic lines in the spectrographs do not change position after artificial aging but the intensities do change. Charts have been prepared of the rate of depolymerization with aging. Comparison of rubber without antioxidant with rubber containing phenyl-beta-naphthylamine shows this type of antioxidant does not appreciably affect the rate of depolymerization.

A Method for the Microscopic Examination of Rubber and Other Solid Technical Products—Frank H. Roninger, Jr., Firestone Tire & Rubber Company, Akron, Ohio.

A method for preparing sections for microscopic examination is described. The method is of general application to raw materials and semi-finished or finished products of the rubber industry, and is of especial value for preparing sections of composite materials, whose constituents differ widely in hardness. The samples are hardened by curing and impregnation with molten sulfur and are then polished by variations of the usual metallographic methods and examined by reflected light. An application of the method to the quantitative estimation of the degree of dispersion of pigments in rubber stocks is outlined. Illustrations show some applications of the method of examination to a variety of products.

The T-50 Test for State of Cure—W. A. Gibbons, R. H. Gerke and H. C. Tingey, U. S. Rubber Co., Passaic, N. J.

In tires, machine supports, conveyor belts, hose, waterproof clothing and footwear and other rubber articles, the state of vulcanization of the rubber in the rubber compound is important for best results in service.

A simple, rapid, accurate physical test for state of cure is described. The test depends upon the observation that for a specific rubber compound the greater the state of cure the lower is the temperature at which chilled stretched rubber will spontaneously retract.

The first step in the T-50 test consists of stretching a piece of rubber, chilling to a low temperature while stretched, and releasing. The rubber remains elongated; in other words, it is "racked." The next step consists of gradually heating the rubber and observing the temperature at which the rubber has retracted to such an extent that it has lost one-half of its original elongation. In many compounds, most of the retraction occurs in a fairly small temperature range. The rate of contraction with increased temperature is usually greatest when the rubber has lost fifty per cent of its elongation. The expression, T-50, means the temperature at which the rubber has lost fifty per cent of its elongation.

The T-50 value for raw rubber is approximately +18°C. and it

decreases as the extent of cure increases. Roughly, every decrease of 13°C. of the T-50 value represents an increase of one per cent of combined sulfur.

The Variability of Rubber From a Plantation Viewpoint—George A. Sackett, Goodyear Tire & Rubber Co., Akron, Ohio.

This paper sets forth some of the causes of variation in plantation smoked sheets and points out how these variations may be overcome. The vulcanization tests are made using mercaptobenzothiazole and comparisons are made with results obtained in the rubber-sulfur mix used by previous investigators.

The Effect of Acicular Zinc Oxide on the Physical Properties of a Rubber Compound—M. K. Easley, The American Zinc Sales Co., Columbus, Ohio.

In rubber stocks where resistance to tear is of no vital importance, acicular zinc oxide offers certain advantages which are not obtained with usual non-acicular type of zinc oxide.

Such properties as increased stiffness with no appreciable change in hardness or abrasion, are of value in the formulation of certain rubber compounds, and this type of zinc oxide occupies a unique position in this respect.

Dispersibility of Gas Black—I. Methods of Measuring Gas Black Dispersion—Raymond P. Allen and Frank K. Schoenfeld, The B. F. Goodrich Company, Akron, Ohio.

Previous investigators have used the nature of the surface, the appearance of micro sections and various physical properties of the stock as a measure of the degree of dispersion of gas black in rubber. In this paper it has been shown that a close relation exists between the nature of a torn surface of gas black stocks and the appearance of micro sections of the stocks. The relationship is so close that the degree of dispersion which is basically shown by micro sections, may be measured by examining the surface. As a practical working tool standard samples of gas black stocks have been prepared and rated in per cent dispersion.

It has also been shown that the character of gas black agglomerates in rubber varies from a hard, rigid type to a soft, easily dispersed variety. A microscopic study of these agglomerates aids in understanding the properties of stocks.

Dispersibility of Gas Black—II. Evaluation of Gas Blacks—Frank K. Schoenfeld and Raymond P. Allen, The B. F. Goodrich Company, Akron, Ohio.

When a pigment is dispersed, energy is needed for the internal friction of the batch, to deflocculate the pigment, and to create the pigment-rubber interface. These energy factors have been studied for the system rubber-black under reproducible conditions. The effect of temperature, shearing forces, and wetting on carbon black dispersion has been investigated. It has been shown that to obtain the maximum in black dispersion the batch must be made receptive to black incorporation and sufficiently intense shearing forces must be developed to break down the black agglomerates. A method of testing the processing characteristics of channel blacks is presented.

Soft Vulcanized Rubber—The Relation Between Combined Sulfur and Vulcanization—B. S. Garvey, Jr., W. D. White and G. Thompson, The B. F. Goodrich Co., Akron, Ohio.

A series of rubber-sulfur compounds and a group of accelerated compounds were mixed and cured following a procedure standardized so that testing results are comparative. The batch stocks and sheets having a wide range of cures were tested for freezing, behavior on the mill, solubility, plasticity, hysteresis, and stress-strain.

While these properties changed with time of cure they did not vary at the same rate and there was no constant relation between the various rates. Compounds were obtained with 0.75% combined sulfur which were only slightly scorched while other compounds with the same amount of combined sulfur were well cured. Stocks in which the combined sulfur was more than 1.0% were scorched beyond the stage permitting processing. One compound was obtained which was well cured in 15 minutes at 142°C., and only scorched after 360 minutes at 142°C., although the combined sulfur was the same in both cures. It was found that heating in the press for 360 minutes at 142°C. does not materially degrade unvulcanized rubber or some types of vulcanized rubber.

Basic Lead Carbonate With Organic Accelerators in the Vulcanization of Rubber—J. R. Sheppard and W. J. Clapson.

Basic lead carbonate strongly activates mercapto-benzothiazole. It promotes fast cures attended by high physical properties and conservation of the organic accelerator: it is substantially equal to litharge in these respects. At factory processing temperatures, however, basic lead carbonate-mercaptobnzothiazole stocks are as free from scorching tendency as zinc oxide stocks of similar vulcanizing properties. Basic lead carbonate may be used in mercaptobenzothiazole stocks either with or without zinc oxide and with much less added stearic acid (or its equivalent) than is required in stocks activated solely by zinc oxide. Data on the systematic variation of mercapto and of basic lead carbonate in typical tread stocks are shown. Data pertaining to other accelerators related chemically to mercapto are also shown. The activity of the basic lead sulphates at vulcanizing temperatures increases with the basicity. Basic lead carbonate, however, appears to reach a maximum activating effect at about 25 per cent basicity; this effect is about equal to that of litharge (100 per cent basicity) at vulcanizing temperatures, but is much less than litharge at processing temperatures.

Autotram Rail Car

(Continued from page 374)

fully streamlined construction with an approximately round front end and a wedge-like rear end. Not only has the contour of the body been such as to reduce wind resistance, but airplane practice has been followed to the extent that all exposed struts and guards have been made of the shape which is conducive to minimum wind resistance.

In the forward part of the body is the power compartment. Above and behind this is the driver's cab, in which are located the controls and the instruments. The front of the cab is of approximately spherical contour and is equipped with windows which give adequate vision ahead and to both sides. Behind the engineer's cab is a passageway, access also is given to the passenger compartment, in which there is a seating capacity for forty passengers.

Windows are fixed and are equipped with double glass, made tight with special double-grooved channel rubber. Lighting is modern and liberal. Ventilation is artificial and of such capacity that the entire air in the car is changed every three minutes. Under this arrangement smoking may be indulged by the passengers without discomfort to non-smokers. Heating is by apparatus especially designed, using waste heat from the engine. Temperature regulation is automatic. The walls as well as the floor and roof are of double shell construction with insulating material between the inner and outer shells so that regulation of internal temperature may be accomplished, without waste, irrespective of weather conditions outside. Sponge rubber cushion under the floor carpets reduces noise and adds to the comfort of passengers.

The Autotram weighs 30,000 lbs. empty but equipped for passenger service; of this weight approximately 12,000 lbs. represents various aluminum alloys. Had it been built of ordinary car structural material, it would have weighed 52,000 to 55,000 lbs.

The Autotram is built for operation on main lines and to that end is equipped with signaling apparatus to operate semaphores and crossing signals. Automatic train control may be installed if desired. The car is equipped with a bell arranged for automatic ringing; with a whistle operated by air; and with sanding apparatus for use on wet rails.

Editorial Comment

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Buying Rubber on the Rise

THE current financial situation appears to offer several interesting sidelights on commodities which are of particular interest to the rubber industry. Due to the suspension of gold payments by proclamation, commodity prices are rising—especially those commodities grown in foreign countries. Some well-informed sources expect the dollar to remain depreciated for some time and as a result rubber appears to be a good buy at this time for those traders and manufacturers who can finance an appreciable stock now. A number of crude rubber houses have been advocating such a course for some time and it appears that the suggestion has much to commend it to the rubber industry.

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Tire Price Cuts . . . !

THERE is no use now in crying over spilled milk—the tire manufacturers again were blindly led into a price war by the bugaboo of mail order cuts. Chaos resulted—and at this writing the industry has not as yet come to its senses. Preaching seems to do no good. Perhaps, however, the Ides of March will do the trick. Spring is on its way and with it, the finest motoring season of the year—and logically one of the best times of the year to sell tires at a profit. A large percentage of the cars put on the road after a winter's layoff will need new tires and tubes. Will the tire industry, with this great profit-making opportunity in sight, restore prices to a decent level or will it continue to try and compete on a price basis with the mail order houses? Sanity is bound to return some day in this industry and there is no better time to make a start than now.

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Orders without profits are not business any more than a pickle is candy.—Charles F. Abbott, Executive Director, American Institute of Steel Construction.

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The Example of Steel

A SIGNIFICANT step was taken on March 3 by the steel industry when all the leading manufacturers immediately followed the lead of the United States Steel Corporation in advancing prices on sheet steel. The step was regarded as the first move in a campaign to check shading of quotations which had unsettled the steel market since the beginning of the year.

If the steel industry can meet "shading of quotations" by raising prices, why does the tire industry reduce prices to meet slightly lower quotations of mail order tires? Must it be admitted that the steel industry has the leadership that the rubber industry lacks?

What would happen, for instance, if one of the big four tire manufacturers should suddenly announce that they were through selling at a loss and that a 20 per cent advance in tire prices would go into effect tomorrow? Would the other makers—both large and small—follow suit (in line with the action of the steel industry) or would they stand pat? You can have your guess, but for our part, based on past experience, we believe we know the answer!

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Courageous Leadership of Roosevelt

THE inauguration is over—and a new leader is in the chair at Washington. As this is written the country is lauding the President's courageous stand as outlined in his inaugural address. Mr. Roosevelt sounded the call to battle when, in referring to the hope that Congress would speedily pass measures toward the amelioration of present conditions, he stated,

> "In the event that the Congress shall fail to take one of these two courses, and in the event that the national emergency is still critical, I shall not evade the clear course of duty that will then confront me.
>
> "I shall ask the Congress for the one remaining instrument to meet the crisis—broad executive power to wage a war against the emergency as great as the power that would be given to me if we were in fact invaded by a foreign foe."

This is an auspicious start from a man who is demanding action—and speedy action. The country will be behind the President to a man and the rubber industry can be counted on to follow his leadership in the difficult days to come.

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Can We Afford It?

THE economic cost of accidents—wage loss, medical expense, and insurance overhead—was estimated by the National Safety Council to be in the neighborhood of two billion dollars last year. This is four times the fire loss of the country and almost as great as the cost of public instruction.

Now if we could somehow eliminate this needless expense we might be able to keep in our pockets all the money we pay out in taxes for schools and instruction.

When one considers the fact that at least 90 per cent of all accidents are needless it doesn't take much figuring to realize that most of the cost of accidents is simply money thrown away.

In times like these can America afford such extravagance?

CURRENT • NEWS of the Rubber Industry

MARCH, 1933

Combined Losses of Goodyear, Goodrich and U. S. Rubber Co., Amount to $17,790,908

Goodyear Makes Poorer Showing Than Other Two As Compared With 1931 Statements—Kelly and Mohawk Also Show Loss

THE latest financial statements for the fiscal year ended December 31 of the leading rubber companies continue to show deficits, though in some cases the loss is less than in the preceeding year. Goodyear, with a loss of $850,394 as compared with a profit of $1,328,623 in 1931, showed the greatest decline of the three large companies whose statements have been released. The U. S. Rubber Co. loss was $10,358,374 as compared with $9,473,404, and Goodrich showed a loss of $6,582,140 as against $8,806,567 in 1931.

The combined loss in sales in 1932 over 1931 was the staggering amount of $116,643,381. Goodyear sales dropped $40,148,074, Goodrich sales were lowered by $40,663,344 and U. S. Rubber sales were $35,831,963 less. More detailed statements follow:

GOODYEAR

REPORT of Goodyear Tire & Rubber Co. and subsidiaries for year ended December 31, 1932, shows net loss of $850,394 after interest, depreciation and other charges including minority interests and write-down of raw materials and raw material content of finished goods to level of June 30 which was lower than that of December 31. This compares with net profit in 1931 of $1,328,623 after all charges and reserves, equivalent to $1.73 a share on 766,524 shares of $7 no-par preferred stock outstanding at end of the year, excluding shares held in treasury.

Inventory write-down for 1932 amounted to $6,475,327 against $5,301,104 in 1931. Depreciation charges in 1932 were $10,103,041, comparing with $11,945,597 in preceding year.

Net sales amounted to $109,051,757 in 1932 against $159,199,831 in previous year.

Consolidated balance sheet as of December 31, 1932, shows total assets of $197,257,433 compared with $207,362,693 on December 31, 1931, and earned surplus of $9,971,008 against $16,146,197. Current assets totaled $99,219,435 and current liabilities were $7,654,224 as compared with $98,954,632 and $9,694,773, respectively, at close of 1931. Cash and government securities, at cost or market, whichever was lower on December 31, last, amounted to $50,073,277 against $37,612,923.

Directors of the company cut the preferred quarterly dividend payment from $1.75 to 50 cents, effective April 1. The $1.25 a share difference will be cumulative "and may be paid at any time conditions justify," a statement said.

Consolidated income account for year 1932, compares as follows:

	1932	1931	1930
Net sales	$109,051,757	$159,199,831	$204,063,229
Exp., tax, dep., etc.	‡108,612,024	‡150,562,168	190,910,570
Balance	$439,733	$8,637,663	$13,152,659
Other inc.	2,728,134	1,314,992	1,646,059
Total inc.	$3,167,867	$9,952,655	$14,798,718
Int. and oth. charges	2,996,819	3,262,528	3,497,638
Divs. of subs., etc.	1,021,442	1,236,080	1,388,848
Loss	$850,394	†5,454,047	†9,912,232
For ex. res.	.....	3,414,040	.....
Res. Gov. bond depr.	.....	711,384	.....
Net loss	$850,394	†$1,328,623	†$9,912,232
Pfd. divs.	5,324,794	5,395,113	5,438,239
Com. divs.	.....	3,583,270	7,001,651
Deficit	$6,175,188	$7,649,760	$2,527,658

†Profit.
‡Includes inventory write-down amounting to $6,475,327 in 1932 and $5,301,104 in 1931.

GOODRICH

THE B. F. Goodrich Co. and subsidiary companies showed a net loss of $6,582,140.01 during the fiscal year ended December 31, 1932. This loss compares favorably with the previous year when a loss of $8,806,567 was reported.

The report for the fiscal year ended December 31, 1932, shows that consolidated sales dropped $40,663,344, sinking from $115,165,147 in 1931 to $74,501,803 in 1932, adding "excluding sales by the Hood Rubber Co., Inc., in 1931, because they were not included in 1932, the decrease amounted to $29,645,836, or 28.4 per cent."

According to the statement, cash in banks and on hand and United States government

(*Continued on page* 386)

Chicago Group Meeting Postponed

The spring meeting of the Chicago Rubber Group, scheduled to be held on Friday, March 10, has been postponed, according to advices received from Secretary B. W. Lewis. The new date of the meeting is expected to be announced shortly.

N.A.W.M.D. Meeting Postponed

The annual meeting of the National Association of Waste Material Dealers, Inc., which had been scheduled for March 13 to 15 in Chicago has been cancelled due to the banking situation, according to an announcement made by President George Birkenstein. The new dates for the meeting will be announced in the near future it is expected.

N. Y. Group Meeting Planned

The next meeting of the New York Group, Rubber Division, A. C. S., will be held on May 5 at the Building Trades Employers Association clubrooms, it was recently decided at a meeting of the Executive Committee. The program, as Chairman A. R. Kemp indicated, would consist of a number of short papers comprising a symposium on a subject of great interest to a large part of the members.

The meeting night was changed to Friday instead of Wednesday as it was felt a larger turnout could be expected at the end of the week. Don't make another appointment for that evening—Friday, May 5.

BOURNE ELECTED HEAD OF AKRON GROUP, A. C. S.

Harry Bourne, general foreman of B. F. Goodrich Co., hose division, was elected chairman of the Akron Rubber Group of the American Chemical Society at its meeting held February 27 at the Akron City Club. He succeeds Harry Conroy of General Tire & Rubber Company. C. A. Carlton of Seiberling Rubber Company was elected vice chairman and E. H. Baker, of Binney & Smith Co., was reelected secretary and treasurer.

The papers read at the meeting were as follows: "Tire Cord and Other Fabrics"—L. A. Graybill, Chief Technical Chemist, Bibb Mfg. Co., Macon, Ga. "Asbestos and Rubber Combinations"—S. Collier, Chief Chemist, Johns-Manville Co., Waukegan, Ill. "Naphtha vs. Gasoline Refining and Effects on Materials Produced"—B. C. Dodd, Anderson-Prichard Oil Corp., Eastern Division Manager.

RUBBER CONSUMPTION RISES IN JANUARY

Consumption of crude rubber by manufacturers in the United States for January amounted to 21,661 long tons. This compares with 16,990 long tons for December, 1932, and represents an increase of 27.5 per cent, according to the Rubber Manufacturers Association. Consumption for January, 1932, was 27,962 long tons.

Imports of crude rubber for January were 31,110 long tons, an increase of 8.9 per cent above December, 1932, although less than 1 per cent below January, 1932.

Estimated total domestic stocks of crude rubber on hand January 31 were 396,376 long tons, which compares with December 31 stocks of 388,229 long tons. January stocks show an increase of 2.1 per cent as compared with December, 1932, and 22.8 per cent above the stocks of January 31, 1932.

The participants in the statistical compilation report 32,539 long tons of crude rubber afloat for the United States ports on January 31, compared with 38,360 long tons afloat on December 31, 1932, and 42,234 long tons afloat on January 31, 1932.

Goodrich Grants Mexican License

The B. F. Goodrich Co. has granted a license to manufacture tires and tubes in Mexico to Compania Manufacturera de Artefactos de Hule Euzkadi, one of the largest rubber companies in Latin America, it was announced in Akron on March 4.

Euzkadi, with a factory in Mexico City, was organized in 1925 for the production of miscellaneous rubber goods. The first manufacture of tires and tubes under the Goodrich license agreement will be started shortly.

R. F. Moody, formerly Goodrich tire production engineer, has been engaged by Euzkadi as plant superintendent. It was stated that Goodrich has no financial interest in Euzkadi and will continue to supply products from Akron to Mexican trade through Cia Tecnica y Mercantil, S. A., Goodrich distributor in Mexico City.

Franz Assets To Be Sold

The referee in the bankruptcy of the Franz Foundry & Machine Co., Akron, Ohio, has announced that an application has been filed for the sale of certain assets of the bankrupt, consisting of the foundry, machinery and equipment, accounts receivable, office fixtures, good-will, scrap material and land of 14.69 acres on which the plant is built. The referee announced that hearings on this application would be held on March 13.

Rand Opens Sales Office

The Rand Rubber Co., Sumner & Halsey Sts., Brooklyn, N. Y., has opened a New York office and showroom where its complete line of rubber sanitary goods will be on display. The company manufactures dress shields, baby pants, bathing caps, baby bibs, rubber sheets, aprons, sanitary belts and other similar specialties. Mr. L. H. Rand, President, will be in charge of the office.

Ideal Joins N. S. C.

The Ideal Roller and Manufacturing Company, 2512 West 24th Street, Chicago, Ill., recently became a member of the Rubber Section, National Safety Council.

Dayton Sales Conference

District managers and executives of the Dayton Rubber Manufacturing Company held a three day sales conference at the Hotel Moraine, Dayton, Ohio, on February 23, 24 and 25. Plans for the 1933 sales campaign were discussed.

Haartz Taken Over

The Duro-Gloss Rubber Company has been formed in New Haven, Conn., to take over the business and plant of J. C. Haartz, Inc., 30 Lenox Street, manufacturers of rubberized automobile and raincoat fabric. Paid-in capital of the new corporation totals $20,000. Harry E. H. Cox is president and treasurer and John H. Parker, secretary. It is understood that no changes in product or manufacturing set-up will be made for the present.

India Receiver Suit Dropped

The suit for the appointment of a receiver brought against the India Tire & Rubber Co. of Mogadore, Ohio, on February 23 by a stockholder was quickly dropped on agreement when it was shown in Common Pleas Court on February 25 that the management had not been wasting funds of the company in a price war and that the interests of the stockholders were amply protected. The statement issued by W. G. Klauss, president of India, follows: "I am happy to announce that the apparent differences outlined in the petition of a stockholder, which was recently filed against the India Tire & Rubber Co., have been adjusted to the entire satisfaction of all parties. The management assures the stockholders of its most diligent effort on their behalf and believes that with their continued support the company will make material progress."

HIDE EXCHANGE PAYS DIVIDEND TO MEMBERS

A dividend of approximately a quarter of a million dollars was distributed among the members of the New York Hide Exchange early this month, it was announced by President Edward L. McKendrew.

The payment was in the form of a $1,000 check to each member of record on February 25, and was a result of the merger of the Hide, Silk, Rubber and Metal Exchanges into the newly formed Commodities Exchange, Inc.

There were 248 members of record on the Hide Exchange and on that basis the distribution amounted to $248,000. It represented the equity due the members after the exchange paid in $900 cash for each of its memberships to the Commodities Exchange, Inc., and liquidated any obligations which may be outstanding up to the time the physical consolidation of the four exchanges takes place.

Announcements regarding the distribution of equities of the other exchanges, based on the liquidation value of memberships, are expected to be made shortly. In the meantime, the various committees of the consolidated exchange are working out the many details in connection with the merger. It is expected that the new exchange will be ready to open about May 1.

Banker Added to Board

Earl R. Hudson, banker, was added to the board of directors of the Goodyear Rubber Company, Middletown, Conn., manufacturers of rubber footwear, at the annual meeting in February. Other directors were reelected as follows: John P. Bacon, Arthur V. McDowell, Charles M. Park, Harold S. Guy, Fred B. Fountain, T. Macdonough Russell, Charles E. Davis, Francis A. Beach and Charles Wetherbee. Reports indicated a slight loss for the year but future prospects were described as good.

Receiver Authorized to Auction Fisk Rubber Company Plant by Court Decree

FEDERAL Judge James A. Lowell recently signed a decree authorizing the foreclosure sale of the Fisk Rubber Company of Chicopee with the exception of $7,000,000 in cash, bonds and certificates of deposit which will be turned over to the creditors. Receiver John B. Pierce was appointed special master to conduct the sale.

The company has tire plants in Chicopee and Cudahy, Wis., and textile plants in New Bedford, Pawtucket, R. I., and Jewett City, Conn. On June 30, 1932, the book value of its properties was listed at $23,000,000.

Mr. Pierce said that the receivers would carry on the business up to and including the date of the sale. The judge set April 4 as the date for either confirmation or rejection of the sale.

A committee working for the reorganization of the company was expected to submit a bid for the property. The New Bedford and Chicopee plants of the company are the only ones operating at present.

The Eberstadt Committee sent a letter to its depositors telling them that it favored the sale of certain assets and properties of the Fisk Rubber Company, as decreed *in* Federal court, stating that this will result in the early termination of the receivership and bring about a prompt cash distribution upon the bonds and notes of the company.

The committee already has obtained the deposit of more than $2,000,000 principal amount of bonds and notes of the company.

The letter states that F. Eberstadt & Co., Inc., is endeavoring to organize a group to acquire the assets for cash for a price which the committee believes should permit an all-cash distribution upon notes and bonds substantially in excess of the current market price of these securities.

Bill Introduced by Cable to Permit Price Fixing in Periods of Stress

Congressman John L. Cable of Ohio Asks Suspension of Federal Anti-Trust Laws as Suggested by Paul W. Litchfield in Hearings

TWO bills were introduced during the closing days of the last Congress by Representative John L. Cable of Lima, Ohio, which would, first, enable manufacturers to enter agreements not to sell below cost and second, to suspend anti-trust laws during periods of economic depression. Mr. Cable is familiar with the situation peculiar to the tire field and had this industry in mind when he introduced in the House, H. R. 14583 on February 7 to authorize agreements on not selling below cost. The other bill, H. R. 14754 was introduced on February 22 following the testimony of P. W. Litchfield before the Senate Finance Committee. (Mr. Litchfield's complete statement to that committee appears on Page 378 of this issue.)

In introducing H. R. 14583 Mr. Cable stated:

"Agreements not to sell below cost should be authorized by law. Cut-throat competition is crippling trade and demoralizing commerce and industry. It is glutting our markets with cheap and shoddy goods. At the same time, it is undermining wages, increasing unemployment and destroying the purchasing power and confidence of the public.

"Prices below cost of production dissipate capital and give unfair advantage to the companies with large bank accounts. Big chain corporations with large resources can weather the storm and drive their independent competitors out of business. Fair competition is throttled, and independents of lesser financial strength are ruined. Unless a business earns costs, it must depend upon credit, exhaustion of which leads to the disaster that has already overtaken many and that now threatens most retailers and business men.

"Only profitable businesses can continue to pay taxes. If there are no profits to be taxed, the Government must dip into capital assets for revenue with which to operate. Taxation of capital is simply killing the goose that lays the golden eggs. When profits only are taxed, the Government can obtain its necessary funds without injury to trade. commerce and industry.

"Regulation of competition is more sensible than cut-throat competition. Selling below cost is as injurious to the consuming public as selling at extortionate monopoly prices, and both should be outlawed. We should regulate competition and stabilize industry and commerce, thereby insuring fair prices, dependable merchandise and adequate revenue for the Government. My bill will do that."

Great interest has been aroused throughout the rubber industry by these bills as tire manufacturers vision the possibilities of concerted action on tire price increases if the bills are passed. The two committees to which the bills were referred are expected to report them out early in the new Congress.

The complete text of the bills follow:

Firestone Tells How He Met 1920 Slump

In a talk at a dinner in Miami on February 21, Harvey S. Firestone told how newspaper advertising and curtailment of production costs helped him meet the depression of 1920 and pay off a debt of $45,000,000.

He said he owed that sum to banks when he returned from a visit to Europe in 1920 to find business in a slump.

"I told my sales manager to go on a vacation; then I placed full-page newspaper advertisements in every city in the United States," he said. "Within two months I sold 18,000,000 tires and reduced my indebtedness to $32,000,000.

"Next, I cut my expenses and readjusted business. In less than four years I did not owe the banks anything. We must change our attitude and concentrate on simple fundamentals to improve business. Let's make a sacrifice and help the other fellow."

H. R. 14583—A BILL TO REGULATE COMPETITION, STABILIZE TRADE AND INDUSTRY, AND FOR OTHER PURPOSES. (*Referred to the Interstate & Foreign Commerce Committee*)

BE IT ENACTED by the Senate and House of Representatives of the United States of America in Congress assembled, that it shall be lawful for a period of two years from the approval of this Act for persons or corporations (except banks and common carriers) in like trade or in like industry to enter into an agreement not to sell or distribute in interstate and foreign commerce their goods, wares, merchandise, or service for less than cost. In order to determine cost such persons and corporations are authorized and empowered to agree to a uniform system of cost accounting. When approved by the Federal Trade Commission, after due notice to all members of the trade or industry and public hearing, such agreements and acts performed pursuant thereto shall be lawful. Any violation of any such agreement shall constitute an unfair method of competition. The Federal Trade Commission is hereby authorized to make all necessary and proper rules and regulations to carry this Act into effect.

H. R. 14754—A BILL AUTHORIZING THE PRESIDENT TO SUSPEND THE OPERATION OF THE ANTI-TRUST LAWS DURING PERIODS OF ECONOMIC DEPRESSION, AND FOR OTHER PURPOSES. (*Referred to the Committee on the Judiciary*)

BE IT ENACTED by the Senate and House of Representatives of the United States of America in Congress assembled, that during periods of economic depression constituting a national emergency, whenever the President has reason to believe that the public welfare requires the regulation of competition in the sale and distribution of wares, goods, merchandise, and services in interstate and foreign commerce, he shall be, and is hereby, authorized to suspend any or all provisions of the anti-trust laws by proclamation.

Sec. 2. During such period of suspension it shall be lawful for persons, partnerships, companies, and corporations to enter into agreements prohibited by the antitrust laws, in the following manner, and not otherwise.

Sec. 3. Whenever any persons, partnership, company, or corporation shall enter into or propose to enter into a contract or contracts to do any act or acts prohibited or thought to be prohibited by the antitrust laws, said persons, partnerships, companies, or corporations shall file said contract or proposed contract with the Federal Trade Commission, together with an application setting forth the reasons for such contract or contracts, and a schedule or schedules setting forth the things to be done or performed thereunder. A copy of said contract, application and schedule or schedules shall at the same time be served upon the Attorney General, and receipt of said service shall be filed with the commission.

Sec. 4. The commission shall promptly set a day for a public hearing on said application, and a notice of said hearing shall be given the Attorney General and all persons who have entered or propose to enter into said contract, which notice shall fix the day and place of hearing on said application at least twenty-one days after service of notice. The Attorney General shall appear and represent the public at said hearing.

The commission shall make a finding or findings in writing, and if, in the opinion of the commision. public welfare so requires, the commission shall enter an order approving said contract, with or without modification

Sec. 5. Such contracts approved by the commission, and all acts of parties thereto done pursuant to the terms of said contracts, shall be valid, binding, and enforcible, and shall not be construed or considered as contrary to or in violation of the antitrust laws.

Sec. 6. The period of suspension of the antitrust laws shall be terminated by proclamation of the President or by joint resolution of Congress. After such termination of the period of suspension, modifications of the contracts approved hereunder shall be subject to the full force and effect of the terms and provisions of the antitrust laws.

Sec. 7. The Federal Trade Commission is hereby authorized to make all necessary and proper rules and regulations to carry this Act into effect.

FINANCIAL REPORTS

(*Continued from page 383*)

securities amounted to $16,511,208. Total current assets amounted to $49,027,155 with current liabilities of $5,331,857, a ratio of 9.2 to 1.

The profit and loss statement follows:

Net Sales		$74,501,803.68
Manufacturing, Selling and General Expenses		72,609,326.07
		$1,892,477.61
Add—Diff. bet. cost and face value of Companies' bonds acquired and Misc. Income		3,348,451.07
		$5,240,928.68
Deduct:		
Provision for Depr...	$4,799,443.60	
Int. on Bonds, Deb., Bills Payable, etc...	3,065,006.21	
Losses in Exchange....	861,107.10	
Inventory write-down	1,125,806.85	
		9,851,363.76
		$4,610,435.08
Deduct—Net Loss applicable to Subsidiary Companies' Capital Stock not owned by The B. F. Goodrich Company		39,834.27
		$4,570,600.81
Add—Write-down of investment in Hood Rubber Co.		2,011,539.20
Loss for Year		$6,582,140.01
Deduct—Tax recovery and Net Adjustments		315,919.41
		$6,266,220.60
Add—Deficit at Jan. 1, 1932		663,337.47
Deficit carried to Balance Sheet....		$6,929,558.07

U. S. RUBBER

REPORT of United States Rubber Co. and subsidiaries for year ended December 31, 1932, shows net loss of $10,358,374 after interest, depreciation, subsidiary dividends, inventory adjustments, expenses of closed plants, etc., and after credit of $1,449,102 difference between par and purchase price of bonds and notes bought for redemption. This compares with net loss in 1931 of $9,473,404, including a credit of $2,034,149, difference between par and purchase price of bonds and notes bought for redemption, and after taxes, charges, inventory adjustments, etc. Net sales amounted to $78,300,091, against $114,132,054.

Current assets, as of December 31, 1932, including $12,491,415 cash and marketable securities amounted to $48,228,363, and current liabilities were $15,742,559. This compares with cash of $13,181,028, current assets of $62,605,969 and current liabilities of $7,625,038 at end of preceding year.

Consolidated income account for year 1932 compares as follows:

	1932	1931	1930
Net sales	$78,300,091	$114,132,054	$157,074,760
Costs & exp...	76,994,905	108,608,461	150,569,088
Oper. profit	$1,305,186	$5,523,593	$6,505,672
Depr. res.	6,541,303	9,672,924	7,347,183
Prov. for pens.	.....	.....	540,126
Interest	4,381,519	4,892,735	5,576,790
Loss	$9,617,646	$9,042,066	$6,958,427
Sub. div., etc.	121,631	192,475	21,714
Inv., adj., etc.	1,573,629	†1,871,655	11,083,799
Exp. of closed plant	494,570	401,357	.....
Loss	$11,807,476	$11,507,553	$18,063,940
Bond & note discount	‡1,449,102	‡2,034,149	.....
Net loss	$10,358,374	$9,473,404	$18,063,940

†After deducting $2,160,641 adjustment from prior reserves, previously set up.

‡Difference between par and purchase price of bonds and notes bought for redemption.

GOODYEAR (Canada)

GOODYEAR Tire and Rubber Company of Canada, Ltd., and subsidiary companies, reporting for the 12 months ended December 31, 1932, show profits of $1,463,653, which after income tax, depreciation and preferred dividends was equivalent to $1.61 on 128,630 shares of common stock. This compares with profits of $2,746,681 for the 15 months ended December 31, 1931, or $8.24 per share on the common.

After providing $745,900 for depreciation there was available for distribution $717,752, as compared with $1,450,011 in 1931. Preferred dividends were paid amounting to $509,743 and the balance of $208,010 was equal to $1.61 a share on the common stock outstanding. To pay common dividends of $643,150 it was necessary to draw on surplus for $435,140, reducing the balance to be carried forward from $7,665,563 to $7,230,422.

KELLY-SPRINGFIELD

Net loss for 1932 after interest, depreciation, inventory adjustments, foreign exchange losses and other charges, was $666,313, compared with $468,334 loss after above charges and after deducting $264,138 provision for possible price fluctuations in crude rubber in 1931. Current assets on December 31, including $919,624 cash, amounted to $7,412,488 and current liabilities were $408,463, compared with cash of $1,748,399, current assets of $8,428,775 and current liabilities of $275,726 at end of preceding year.

RAYBESTOS-MANHATTAN

During 1932, Raybestos-Manhattan, Inc., incurred a net loss of $457,167.39, after provisions of $555,647.66 for depreciation.

The company's balance sheet at December 31, 1932, showed current assets of $6,277,670.73, equivalent to twenty times the current liabilities of $312,630.07. There were no bank loans, bonds, or other funded indebtedness.

The directors declared a dividend of 15 cents per share, payable March 15, 1933.

MOHAWK

At the annual meeting of stockholders of Mohawk Rubber Co., C. Borland, president, stated that the company's net loss for the year ended December 31, 1932, was $94,000, after all charges, including depreciation, interest, taxes and adjustment of inventories. Operating profit before these charges was $278,979. Directors and officers were re-elected.

THERMOID

Report of Thermoid Co. and wholly owned subsidiaries for the year ended December 31, 1932, shows net loss of $199,868 after depreciation, interest, etc. In 1931, the company reported profit of $163,413 after depreciation, interest, etc., but no mention was made of federal taxes.

Current assets as of December 31, 1932, including $740,570 cash and marketable securities, amounted to $1,865,604 and current liabilities were $281,275. This compares with cash of $603,718, current assets of $2,115,847 and current liabilities of $33,369 at end of preceding year.

BOSTON RUBBER GROUP TO MEET ON APRIL 6

The Boston Rubber Group of the American Chemical Society will hold its annual meeting and election on April 6th. The dinner preceding the meeting will start at 6:30 p. m. at the University Club in Boston.

A paper will be presented by S. G. Byam of the E. I. DuPont de Nemours and Company on "Problems of the Proofing Industry." A second paper will be presented by E. M. Hayden, technical director of the Stanley Chemical Company, on "The Uses of Lacquer in the Rubber Industry."

A paper on "Uncommon Remarks About Advertising," by J. A. Seaverns of Howe & French, Inc., will also be given.

Tickets for the dinner will be $1.75 and may be obtained by writing to J. J. Sindler, Secretary-Treasurer, care of Converse Rubber Company, Malden, Mass.

RUBBER GOODS EXPORTS CONTINUE TO DECLINE

The total value of exports of rubber products from the United States to foreign countries in 1932 declined 55.4 per cent under 1931, the decrease being particularly marked in exports of rubber footwear, according to a release by the Rubber Division of the Department of Commerce. The total value of rubber products exported in 1932 was $16,364,678, compared with $37,710,910 in 1931.

The rubber products which showed less than average reductions in volume of exports during 1932 include packing and hose, insulating tape and electrical hard rubber goods, auto topping, carriage and other solid tiring, erasers, and rubber goods.

Exports of automobile and other casings, rubber belting, rubber heels and rubber boots, toy balloons, and bathing caps declined more than average during the year.

Mexican Plant for General Tire

The General Tire and Rubber Company has acquired management control of the Compania Hulera El Popo S. A., a Mexican tire manufacturing company that has been in operation ten years and has a capacity of 500 tires a day. William O'Neil, president of General Tire, will become a director of the Mexican company. Alfredo Guijarro, who has been Mexican manager for General Tire, will be general sales manager and local director of the Mexican plant.

Akron Plants Shutting Down

The lack of banking facilities due to the national moratorium is having its effect on Akron rubber factories. It was announced on March 5 that the Goodyear plant would go on a two-day week for factory employes and a three-day week for office employes. The Gadsden, Alabama, plant is being shut down entirely. The Master Tire & Rubber Company at Cuyahoga Falls also announced that its factory would go on a two-day week. No definite announcement has been made at this date by any of the other local rubber factories but it is expected they will also curtail activities unless the banking situation changes shortly.

Increase in Cotton Prices Expected If Present Plans Prove Successful

THE rubber industry is interested in the possibilities of success of the attempts being made in various quarters looking to the reduction of cotton planting during the coming season. Increased prices for cotton will be the inevitable result of any serious curtailment of production—an increase in price which will be welcomed by those factors in the rubber industry who seek higher retail prices for tires.

The outstanding attempt to help the cotton farmer get more for his crop is embodied in the terms of the Smith Cotton Relief Bill which was passed by Congress late in February but given a pocket veto by Hoover on his last day in office. Senator Smith, however, has stated that he will offer his bill again to the new Congress and there appears to be a fair chance of its passing shortly.

The Smith Bill provides that a board to be created within the Department of Agriculture shall take over all of the cotton owned by the government or upon which the government has advanced funds. This includes cotton held by the Department of Agriculture as collateral for crop production loans, and cooperative cotton held by the American Cotton Cooperative Association.

This cotton would be placed in a pool and would be sold to farmers who reduce their 1933 cotton production by 30% under 1932. Under the House bill, the cotton would be sold to the farmer at its average price to this new board. Under the Senate bill it would be sold at its market price at the time the farmer entered into the contract to reduce production 30%.

The theory of the bill is that with the production reduced by 3,000,000 bales or more, the price would rise sufficiently so that in disposing of the cotton purchased from the pool the farmer reducing his acreage would be compensated by the higher price he could obtain both for the pooled cotton and that remaining from his production.

OVERMAN WINS VERDICT IN TIRE PATENT SUIT

Overman Cushion Tire Company, Inc., announced on February 24 that as a result of its suit against Goodyear Tire and Rubber Company, for infringement of tire patent rights, Judge Francis G. Caffey of the United States District Court of the Southern District of New York, has awarded them damages for $1,098,820, together with interest from May 2, 1930, the date when infringement was halted by injunction, and costs.

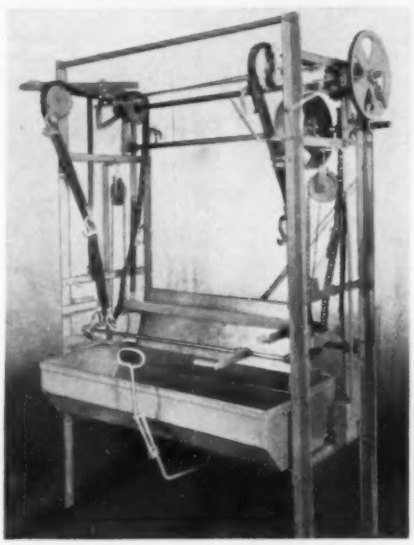
It is understood, however, that a similar suit is pending in Ohio where, it was said, there is a possibility of a favorable decision.

In any event, the New York court's decision will be appealed to the United States Circuit Court of Appeals, and if the Ohio case is favorable to Goodyear, will be taken to the United States Supreme Court, it was announced.

Moves Akron Office

The Akron office of Charles T. Wilson Company, Inc., crude rubber importers, has been moved to 100 Beech Street.

Wall's Rubber Shoe Varnisher



The machine illustrated here is a rubber shoe varnisher which is standard equipment in many of the leading rubber shoe factories in this country and Canada. It is simple to operate as the bank of shoes are dipped and raised from the supply of varnish by means of a double system of sprocket chains. It insures, according to its manufacturer, absolute uniformity in product as well as economy in operation. The machine requires little floor space and can be operated by unskilled labor. It is manufactured by John H. Wall, 41 Constitution street, Bristol, R. I.

Malaya Production Less

Rubber production on Malayan estates totaled 35,822 tons during January, 1933, compared with 40,974 tons in December and 41,952 tons for January, 1932.

Outputs on small estates, mostly native owned, were 16,106 tons, against 18,534 tons in December, and on large estates, chiefly foreign owned, 19,716 tons against 22,440 tons in the previous month.

Stocks on estates were 21,517 tons, against 21,777 tons in December and 22,161 tons in January, 1932. Dealers' stocks were reported at 24,904 tons, compared with 24,320 tons in December, and 26,468 tons one year previous.

Barr Rubber Reelects

At the meeting of stockholders of the Barr Rubber Products Co., Sandusky, Ohio, held on February 23, the present directors and officers of the company were re-elected.

Joseph M. Huber

Joseph M. Huber, president of J. M. Huber, Inc., and affiliated companies, manufacturers of carbon black, clay and printing inks, died at his home at Locust, N. J., on March 3 of heart disease at the age of 74.

Mr. Huber was born in Munich, Germany, in 1859 and began his business career with his father, Michael Huber, head of the firm of Michael Huber Printing Ink Company of Munich. In 1884, Mr. Huber came to the United States and in 1886 established here his business of importing dry colors. Soon afterward he began the manufacture of dry colors and printing inks in the United States.

The other companies now bearing his name are engaged in the production of carbon blacks, china clays, natural gas and petroleum.

Mr. Huber is survived by his widow, the former Miss Anna Gundlach, and four children, Marion Huber, Mrs. Robert E. Mertens, Walter Huber and Hans W. Huber, and in Germany by a brother, Julius, and a sister, Mrs. Wally Ehrengut.

Eminent Statistician Dies

Lieutenant-Colonel John Conrad Gie Kunhardt, late Indian Medical Service, who died recently at his home at Totland Bay, Isle of Wight, did very valuable work on plague prevention in India, and later became known for his close study of the rubber industry.

Born in South Africa in 1875, Kunhardt graduated in medicine in London, and was commissioned to the Indian Medical Service in 1902. From 1910 onwards he was a member of the Indian Plague Research Commission, investigating the epidemiology of this disease, which had fastened itself upon India in Bombay in 1896. The basis of his work was the finding of the Indian Plague Research Commission that bubonic epidemics might be regarded as entirely dependent on epizootic plague in rats, communicated to man by rat fleas.

Before and after his retirement from the public service in 1925, Lieutenant-Col. Kunhardt used the skill he had acquired in dealing with statistical data and making scientific deductions therefrom in an intensive study of the rubber industry. He turned his periods of leave to account by visiting the rubber-producing areas in the East, and made more extensive personal investigations after retirement.

In 1921 he published a booklet expounding original and optimistic views, entitled "An Analysis of the Statistical Position of Rubber." His strong belief that there would be a great increase in consumption in response to the needs of the automobile and other industries was one of the factors which led him to view with grave misgivings the Stevenson restriction plan. He always predicted that the scheme would enure to the injury of Empire growers.

Kunhardt's unorthodox opinions were received with grave doubts by leaders of the industry at first, but gained some acceptance as time went on. It is interesting to note that as recently as 1930 the Rubber Shareholders' Section of the Institution of the Rubber Industry gave its imprimatur to a substantial pamphlet by Colonel Kunhardt on "The Future of Rubber." Colonel Kunhardt married in 1927.

Farrel Annual Meeting

The annual stockholders' meeting of Farrel-Birmingham Company, Inc., was held at the main office of the company at Ansonia, Conn., February 16, 1933. The following directors were elected: Charles F. Bliss, Henry F. Wanning, Franklin Farrel, Jr., Nelson W. Pickering, Frederick M. Drew, Jr., David R. Bowen, Carl Hitchcock, Franklin R. Hoadley, Armin G. Kessler, Walter Perry, Julius G. Day, Fernley H. Banbury, William B. Marvin, Edward H. Green, William A. Gordon, Alton A. Cheney, George C. Bryant.

Following the stockholders' meeting the Board of Directors met and elected the following officers: Franklin Farrel, Jr., Chairman of the Board of Directors; Nelson W. Pickering, President; David R. Bowen, Vice-President; Carl Hitchcock, Vice-President; Franklin R. Hoadley, Vice-President; Armin G. Kessler, Vice-President; Frederick M. Drew, Jr., Treasurer; Laurie K. Blackman, Assistant Treasurer; George C. Bryant, Secretary; William B. Marvin, Assistant Secretary.

Frederick M. Drew, Jr., was elected Treasurer and Director in place of Alton Farrel, resigned.

Cincinnati Rubber Modernizes

Contracts have been let by the Cincinnati Rubber Manufacturing Co., manufacturers of mechanical goods, Cincinnati, O., for a 400 h.p. high pressure boiler, a new concrete smoke stack and coal handling and storage equipment at a total cost of $75,000.

RALPH B. HUBER, formerly chemist at Fisk Rubber Company, is now New England Sales Representative for D. H. Litter Company, Inc., New York, dealers in chemicals, pigments and colors for the rubber and paint fields. Mr. Huber makes his headquarters at 216 Tremont Street, Boston, Mass.

Rubber Stock Quotations

	Mar. 4	1933 High	1933 Low
Aetna	1*	1	⅞
Faultless	17½*	20	17½
Firestone	10	14⅜	9½
" 6% Pfd.	42½	63⅜	42
Fisk, new	1¼	2	1
General	27*	27	25
" Pfd.	30*	33	30
Goodrich	3½	6⅛	3
" Pfd.	9	18¼	9
Goodyear	12	18⅜	12
" 1st Pfd.	29½	45	27½
India	2	2⅝	2
Kelly-Springfield	1	2	⅞
" 6% Pfd.	6	10	6
Lee	3¾	6½	3¾
Mohawk	1⅞*	1⅞	1½
" Pfd.	20*	20	20
Norwalk	1¼	2¼	1⅛
Raybestos Manhattan	5⅞	7½	5
Seiberling	2	2½	1¾
" Pfd.	14¾*	—	—
Thermoid	1	1½	1
U. S. Rubber	3¼	5¾	2⅞
" Pfd.	6½	12	5½

*Last available quotation

Names in the News

Celebrates 25 Years With Firestone

John W. Thomas, President of Firestone Tire & Rubber Company, celebrated 25 years of service with Firestone on January 19. Mr. Thomas, a graduate of Buchtel College, now Akron University, started as factory chemist in 1908. His next duties, a year and a half later, were in charge of the drying room, then in the processing department.

This promotion was the first in a long succession of advancements which took him through all the departments of Firestone and gave him the background so essential to the administration of his present job. Within eleven years after he had joined the company he was its vice-president, and last year he was elected to his present office.

Mr. Thomas' rise offers an inspiration for every young man. Born on his father's farm in Tallmadge, about five miles from Akron, November 18, 1880, he was quick to realize the advantage of education and, although colleges were not widely attended in those days, he succeeded in his youthful ambition to obtain a college education. For the college which gave him the scientific training so useful in his industrial career he has always had the deepest affection. Today he is chairman of its board of directors and is active in many ways in the civic life of the city where he gained his schooling.

The story of his rise can be described no more effectively than in these brief words of Mr. Firestone:

"I doubt," said Mr. Firestone, "if you can find a better example anywhere of a man starting at the bottom and advancing to the top. Mr. Thomas did it not only by hard work but by having faith in his organization and loyally adhering to the policies which he helped to mold and which he knew were right."

L. W. RYAN, formerly with the Titanium Pigment Company, is now director of research, United Color and Pigment Company, Newark, N. J.

E. C. SAUTER, manager of the Chillicothe, O., branch of Goodyear Tire & Rubber Co., has succeeded J. C. EGGLESTON as manager of the Columbus, O., store. Mr. Eggleston takes charge of Goodyear operations in central Tennessee with headquarters in Nashville.

FRED HARPHAM of Goodyear Tire & Rubber Co., was elected second vice-president of the Better Akron Federation at a recent meeting of the board of trustees. W. E. FOUSE of General Tire & Rubber Co., was selected as a member of the board, of which H. S. FIRESTONE is also a member.

W. C. YOUNG, manager of aeronautic department of Goodyear Tire & Rubber Co., recently addressed the Daughters of the American Revolution in Akron. Mr. Young devoted his talk largely to a description of the U.S.S. *Macon* which was launched on March 11.

D. J. BEAVER, formerly chemist in the laboratories of the General Atlas Carbon Co., is now with Rubber Service Laboratories Co., in Nitro, W. Va.

C. J. HARWICK, formerly of C. P. Hall Co., recently formed the Standard Chemical Co., Beacon Journal Building, Akron, O., and is offering chemicals for the rubber industry, including Zip mold cleaner, a preparation for cleaning iron and steel molds.

CLIFFORD A. JONES, vice-president and general manager of the Seiberling Rubber Co. of Canada, Limited, has resigned both offices due to ill-health. R. J. THOMAS succeeds Mr. Jones as vice-president. Connected with the company for 22 years, Mr. Jones worked up from the position of junior to that of assistant sales manager for the parent company in Akron, O.

C. H. CARLISLE announced his retirement as general manager of Goodyear Tire and Rubber Company of Canada at the annual meeting of stockholders. Mr. Carlisle will continue as president of the company. R. C. BIRKENSHAW, who has been with the company for 13 years, was named Mr. Carlisle's successor as general manager.

LEONARD FIRESTONE, son of Harvey S. Firestone, Sr., took over his duties as vice-president of the Firestone Tire and Rubber Company of California, it was announced in Akron on February 28. Since his graduation from Princeton University in 1931 he has been associated with the Firestone offices in various capacities, but specialized principally on work with the service stores department.

CHARLES S. DAHLQUIST recently has been made executive engineer in charge of rubber tire railcar development at the Edward G. Budd Manufacturing Company, Philadelphia.

New Rubber Goods

Cured-In Valve

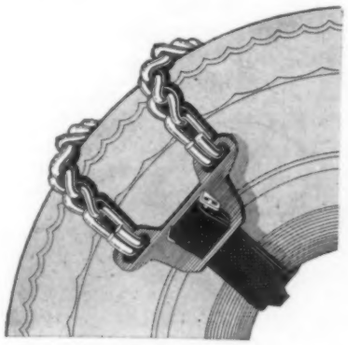
According to an announcement made by The B. F. Goodrich Rubber Company, an important improvement has been made in heavy-duty truck and bus tube construction by the development of a "cured-in" valve, in which the valve base is vulcanized to the valve pad, and this in turn to the tube. This construction makes the valve pad and tube an integral unit and is said to render leaks at this point virtually impossible.

The new cured-in valve construction has been used on the popular sizes for high speed, long distance bus and truck operations where extreme heat are encountered. It will be extended to the entire line of Goodrich heavy-duty tubes in all sizes used in truck and bus service.

Lion Tire Chain

A new and improved type fastener and a strap of rubberized webbing are the outstanding features of the new emergency chains being manufactured by the Lion Chain Co., Chicago.

These chains are easy to put on, are guaranteed to "stay put"—yet very easy to unfasten and take off.



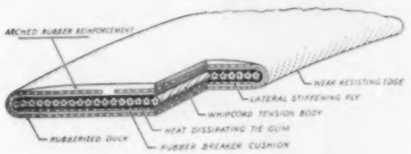
These chains are available in two grades—Regular and Molybdenum, and have extra heavy, case hardened cross chains.

New "Cushionair" Tire

The Norwalk Tire and Rubber Company, Norwalk, Conn., have introduced a new Shockpad "Cushionair" tire for which a 15-month guarantee against cuts, stone bruises, faulty brakes, road smashes and misalignment of wheels is given. It is an 8-ply tire for which 6-ply riding quality is claimed. It has a shock pad of heat resisting and strength giving red rubber built on the inside as an integral part of the casing.

Condor Whipcord Cone Belt

With the strength member consisting of a layer of closely spaced pretreated whipcord, wound continuously and completely embedded in rubber, the cone belts redesigned by Manhattan Rubber division of Raybestos-Manhattan, Inc., Passaic, N. J., are said to have an increased service life of four to eight times that of earlier designs. Low inelastic stretch, high degree of bending



flexibility and ample tensile-strength are features of the new belt.

In addition to the new design, the company has combined the various odd sizes of cone belts into sixteen standard sizes which provide a belt that will fit correctly all cone drives without change in the pulley set-up.

NEWS FROM TRENTON

James P. Flynn, general manager of the Puritan Rubber Co., Trenton, N. J., has returned from a trip to the far west and south where he spent seven weeks in visiting the company's distributors. He said he found conditions improving.

The great amount of snow and rain during the winter has resulted in increased production of boots and shoes at the plant of the Lambertville Rubber Company, Lambertville, N. J.

Rubber Manufacturers' Association of New Jersey held its late winter dinner and meeting at the Trenton Club, Trenton, N. J., February 14. A talk on rubber by the members featured the evening.

The majority of the rubber companies at Trenton, N. J., report that business has dropped off to some extent. The Hamilton Rubber Company was closed down for a week while inventories were being taken. Tire production has also dropped off.

Harry W. Roberts, president of the Pierce-Roberts Rubber Company, Trenton, N. J., recently celebrated his 49th birthday. Mr. Roberts is active in civic affairs of Trenton.

Bruce Bedford, president of the Luzerne Rubber Company, Trenton, N. J., has again been selected as vice-president of the Trenton Board of Education.

Three officials of the Insulated Duct and Cable Company, Trenton, N. J., were held up recently and the payroll of several hundred dollars stolen. Leo V. Drake, superintendent and paymaster; Lester P. Murphy, foreman, and George Most, a clerk, were the victims. They were making up the payroll in the office when three armed banbits entered.

William J. B. Stokes, president of the Joseph Stokes Rubber Company, Trenton, N. J., spent several weeks with Mrs. Stokes in Bermuda last month.

NORWALK ADDS RUBBER PRODUCTS TO ITS LINES

The Norwalk Tire and Rubber Company, Inc., Norwalk, Conn., which about a year ago supplemented its regular line of truck and passenger car tires by the addition of battery manufacturing, has recenlty added to its line of rubber products in the automotive field.

The accessories, all marketed under the trade name "Norwalk Gold Standard," include fender flaps, all-rubber step plates, door silencers, woven and molded brake lining, radiator hose and fan belts.

A. A. Hall, sales manager, reports that the company's battery business has shown a tremendous increase since operations were started in that field last year and the company has recently installed additional equipment to double the factory volume. The Norwalk Gold Standard battery was formerly manufactured in Detroit, Mich. as the G. & M. battery.

Addition of the new accessory lines, according to Mr. Hall, has provided an additional source of revenue without the necessity of developing an entirely new market, as the items are sold to the same market as the regular tires and batteries.

SHIPMENTS OF TIRES INCREASED IN DECEMBER

Shipments of pneumatic casings for the month of December, 1932, amounted to 1,818,700 casings, an increase of 6.3 per cent above November of that year, but were 34.6 per cent below December, 1931, according to statistics released by The Rubber Manufacturers Association, Inc.

This organization reports production of pneumatic casings for December, 1932, to be 1,982,681 casings, a decrease of 13.9 per cent under November of that year, and 25.0 per cent below December, 1931.

Pneumatic casings in the hands of manufacturers December 31, 1932, amounted to 7,644,359 units, an increase of 2.5 per cent above November 30, 1932, stocks, but were 1.7 per cent under December 31, 1931.

The actual figures are as follows:

PNEUMATIC CASINGS

	Shipments	*Production*	*Inventory*
Dec., 1932	1,818,700	1,982,681	7,644,359
Nov., 1932	1,711,298	2,303,545	7,454,443
Dec., 1931	2,781,295	2,643,221	7,774,720

Tenth Anniversary of Sponge Rubber

The Sponge Rubber Products Co., Shelton, Conn., observed its tenth anniversary at a banquet for executives and employes, February 27. About 160 attended and the dinner was followed by a speaking program and a dance. The speakers included Frederick M. Daley, president; William R. Todd, secretary and treasurer; Lowell D. Smith, vice-president; Ralph A. Holbrook, chemist; Chester A. Garvin, office manager; John L. Rowe, New York representative; J. Edward Bergeron, sales staff; Mrs. Ruth A. Paul, general forewoman; Mrs. Daley, Mrs. Todd and Mrs. Smith.

REVIEW SHELF

• Monthly Review of New Books, Pamphlets, Company Catalogs, Service Bulletins, House Organs, etc., Pertinent to the Industry.

"LATEX AND ITS INDUSTRIAL APPLICATIONS," by Frederick Marchionna, published by THE RUBBER AGE, 250 West 57th St., New York City. Cloth bound, 1060 pages. 6 x 9¼ in. Price, $15.00 postpaid.

This new volume is a welcome addition to the technical literature on Latex inasmuch as it treats this subject in a more detailed and comprehensive manner than any other work available. The book is especially timely as interest in latex is greater today than ever before—not only in the rubber industry but also in many fields not heretofore users of rubber in any form.

With the direct use of latex increasing rapidly, there has become apparent a need for a bibliography which would gather together all the more important patents on this subject as well as a resume of the published literature. Much of this information is not readily available to the research worker and to many of the rubber companies and accordingly this new book serves to bring together for the first time all the essential literature on this subject.

The compiler of this bibliography, while working in the United States Patent Office, has had occasion to observe the great need for an exhaustive work on latex and its uses. Since there are several good books on the market, such as "Estate Rubber—Its Properties and Testing," by Dr. O. de Vries; Professor G. St. Whitby's excellent monograph, "Plantation Rubber and Testing of Rubber"; B. D. Luff's "The Chemistry of Rubber"; O. Weber's "The Chemistry of Rubber Manufacture"; Dr. P. Schidrowitz's "Rubber"; Gottlob's "Technology of Rubber"; Dr. E. A. Hauser's "Latex," and others, a greater need has been felt for a bibliographic work in which all the investigation and researches which have been carried out on latex from the plant to the manufacture of rubber products, all the practical applications in the direct use of latex, as described in patents, are briefly, clearly, and succinctly abstracted.

Thus was born the idea to supply this need, and the work has been facilitated by the well supplied libraries in the Government Departments of the Patent Office, Bureau of Standards, Bureau of Chemistry, Department of Agriculture, and the Library of Congress.

These abstracts include the technical literature involving plantation, collection, coagulation, concentration, vulcanization, and direct use of latex. It has been thought better to cover fully the use of Hevea latex, and only incidentally, other types of latices so as to bring out the comparison between the behavior and properties of latices from various rubber bearing plants.

Contact at the Patent Office with the patent and technical literature of the world led the author to conclude that in the field of rubber technology—industrial applications of rubber—there are four nations which dominate the field: United States, England, France and Germany. Any important patent from another country is certain to be duplicated in some corresponding patent granted in any or all of the four named countries. In the German edition of Dr. E. A. Hauser's "Latex." Dr. Carl Boehm Von Boernegg, in compiling a short bibliography of patents on latex, made the statement that England, Germany and France predominate in the field of patent development on latex and rubber; none of the United States patents were included in this short bibliography. The compiler of this work, however, has found that the United States leads all the other countries in the field of patents on latex and its industrial applications.

In abstracting the articles in technical journals and the patents, the compiler has had in mind briefness, thoroughness, and lucidity. Attention has particularly been paid to original research done by scientists advancing new theories, new concepts in the field of application of the new physics and chemistry to rubber. Careful attention has been given to the present trend in the industrial application of latex, so that in the abstracts not only the process and apparatus have been described, but also the intended purpose and use have been brought out. This has been done for the purpose of enabling scientists, inventors, industrials, technical men, etc., to derive the greatest possible advantages and benefits from the reading of the book, without the necessity of consulting the original source if it is not readily available.

The bibliographic work has been arranged in chapters to facilitate the search for a particular subject. The literature has been placed after the patents for each particular subject, since the technical articles are, in several instances, criticisms of certain patent developments, or reports of investigations on the value of certain patented processes or machines. The abstracts are unbiased; they merely state in brief what has been described or said without making any personal critical comment.

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GOVERNMENT EXTRAVAGANCE—THE CAUSE OF PRICE CUTTING, by Allen W. Rucker in collaboration with N. W. Pickering, president of Farrel-Birmingham Co., Inc., Ansonia, Conn. Paper cover, 12 pp. 3¾ x 7 in. For free distribution.

This booklet discusses government extravagance and its effect on business and price cutting from the viewpoint of a machinery manufacturer who is in constant contact with various industries. According to the authors, the chief underlying cause of price cutting is a deficiency of purchasing power caused by use of bank credit for governmental financing. The ease with which the Federal government, the states and municipalities finance their obligations leads to extravagance and the solution, according to Messrs. Rucker and Pickering is a drastic cut in government cost.

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THE VANDERBILT NEWS, issue of January-February, 1933, issued by R. T. Vanderbilt Co., New York. Free distribution.

This issue is devoted entirely to a discussion of Plastogen, the new plasticizer for rubber which the Vanderbilt company brought out recently. This material is offered as a reducer of the cost of processing as it enables the compounder to reduce the time of milling and to insure uniformity in calendering, tubing and molding. Not only are the mill-room results with Plastogen given but the effect of this material on the various properties of raw rubber and several different compounded stocks are treated exhaustively.

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BACHARACH INSTRUMENTS, Bulletin on Direct Reading Manometers. 18 pp. 8 x 11 in. Free distribution.

This bulletin describes type MG, type MF and type MTB direct reading manometers. They are made in five standard types and twenty stock sizes to meet all usual requirements. They may be used to indicate pressure, suction or differential pressure over practically any range up to 160 inches of water or 80 inches of mercury, or 40 pounds per square inch.

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"LE PROBLEME DES ALTERATIONS DU CAOUTCHOUC PAR L'OXYGENE ATMOSPHERIQUE'," reprint of two articles by M. Charles Dufraisse in the October and November, 1932, issues of *Revue Generale du Caoutchouc*, Paris. 28 pp. and cover. 8¼ x 10½ in. Free distribution.

The author gathers together the various theories on oxidation which have appeared from time to time in various countries and discusses them under several heads, as Oxidation of Rubber, Action of Oxygen, Oxidation in the Laboratory. The article appears to be very complete as is evidenced by the 242 references to the bibliography of the literature.

MARKETS

RUBBER—COTTON AND FABRICS—CHEMICALS

NEW YORK, MARCH 9, 1933

Crude Rubber

THE industry is concerned mainly with what action prices will take when trading on the exchange is resumed. Since the exchange closed after trading on March 3 due to the bank moratorium, there have been no official quotations but it expected that they would open about 50 points above latest figures, and that a price of 4c or over is not improbable in the near future. Local outside quotations for March 4, and London and Singapore for March 7, follow:

Plantations—

Ribbed Smoked Sheets—			
Spot	—	@	.03 1/16
March	—	@	.03 1/16
Apr.-June	—	@	.03 1/16
First Latex, crepe spot	—	@	.04
Amber Crepe, No. 2	—	@	.02 11/16
Amber Crepe, No. 3	—	@	.02 5/8
Amber Crepe, No. 4	—	@	.02 1/2
Brown Crepe, Clean thin	—	@	.02 5/8
Brown Crepe, rolled	—	@	.02 5/8

Latex—

Liquid Latex, per gal.	.42	@	—

Paras—

Up-river, fine	—	@	.06
Up-river, coarse	Nominal		
Acre Bolivian, fine	—	@	.06 1/4
Caucho Ball, Upper	—	@	.03

Balata—

Block, Ciudad	—	@	.16

LONDON MARKET

Standard Smoked Sheets—Buyers—March 7			
Mar.	—	@	2 3/32d
April-June	—	@	2 3/32d

SINGAPORE MARKET

Standard Smoked Sheets—Sellers—March 7			
March	—	@	1 11/16d
April-June	—	@	1 11/16d

Scrap Rubber

The market has been exceedingly quiet but as soon as trading is again resumed, prices are expected to show a material advance. Current quotations follow:

(Prices to Consumers)

Auto tire peelings	ton	13.50	@15.00
Mixed auto	ton	6.50	@ 7.00
Clean solid truck tires	ton	22.50	@25.00
Boots and shoes	ton	15.00	@16.00
Arctics, untrimmed	ton	10.00	@12.50
Inner tubes, No. 1	lb.	.01 7/8	@ .02
Inner tubes, No. 2	lb.	.01 1/4	@ .01 3/8
Inner tubes, Red	lb.	.01 3/8	@ .01 1/2

Reclaimed Rubber

INTEREST in reclaims apparently has been increased due to the shutdown of the rubber and other exchanges which presages, in the mind of many, increased prices when the exchanges reopen. Accordingly the prices given below are purely nominal as no quotations can be obtained from reclaimers at this time.

High Tensile

High Tensile Red	lb.	.04 3/4	@	.05
Super-Reclaim Black	lb.	.05	@	.05 1/4

Shoe

Washed	lb.	.05 1/2	@	.05 3/4

Tube

No. 1 (Floating)	lb.	—	@	.06 1/2
No. 2 (Compounded)	lb.	.04 1/2	@	.04 3/4

Tires

Black	lb.	.03 3/4	@	.04
Black, selected tires	lb.	.04	@	.04 1/4
Dark Gray		.05	@	.05 1/4
Light Gray	lb.	.05 1/2	@	.06
White	lb.	.05 1/2	@	.05 3/4
Truck, Heavy Gravity	lb.	.05	@	.05 1/4
Truck, Light Gravity	lb.	.05 1/4	@	.05 1/2

Miscellaneous

Mechanical blends	lb.	.03	@	.03 1/2

Cotton

Since the exchange closed on March 3 there have been no official quotations but it was reported that spot cotton had changed hands at close to 8c compared to 6.35c on March 3, which in itself was a rise of 35 points over Feb. 6.

High, low and closing prices as of March 3, were as follows:

	March 3			Feb. 6
	High	Low	Close	Close
March	6.20	5.94	6.18	5.90
May	6.30	6.02	6.26	6.04
July	6.42	6.16	6.40	—

Tire Fabrics

[These quotations are as of March 3, since which date there has been little trading and no reliable prices.]

(Prices Net at the Mill)

Peeler, carded, 23/4/3	lb.	.23 3/4	@	—
Peeler, carded, 23/5/3	lb.	.22 3/4	@	—
Peeler, carded, 18/3/3	lb.	.19 3/4	@	—
Peeler, carded, 15/3/3	lb.	.20 3/4	@	—
Egyptian, carded, 23/5/3	lb.	.34 1/4	@	—
Egyptian, combed, 23/5/3	lb.	.39 1/2	@	.40
CHAFERS				
Carded, American, 8 oz.	lb.	.15 1/2	@	.16
Carded, American, 10 oz.	lb.	.15 1/2	@	.16
Carded, American, 12 oz.	lb.	.15 1/2	@	.16
Carded, American, 14 oz.	lb.	.15 1/2	@	.16
LENO BREAKER				
Carded, American, 8 1/4 oz.	lb.	.16	@	.19
Carded, American, 10 1/4 oz.	lb.	.18	@	.21
SQUARE WOVEN				
Carded, American, 17 1/4 oz. 23-11 ply	lb.	.22 3/4	@	—
Carded, American, 17 1/4 oz. 10-5 ply	lb.	.15 1/2	@	—

Sheetings

40 inch, 2.50 yard	yd.	—	@	.05
40 inch, 2.85 yard	yd.	.04 1/2	@	—
40 inch, 3.15 yard	yd.	.05	@	—
40 inch, 3.60 yard	yd.	.04 1/2	@	.04 3/8
40 inch, 3.75 yard	yd.	.03 5/8	@	—
40 inch, 4.25 yard	yd.	.03 5/8	@	—

Ducks

Enameling	lb.	.17 1/2	@	.21
Belting and Hose	lb.	.18 1/2	@	.19
Single filling	lb.	.06 3/4	@	.07
Double filling	lb.	.08 1/2	@	.09

Closing Prices on Rubber Exchange of New York, Inc.

No. 1 Standard Contract of 10 Tons*

FROM FEB. 7 TO MARCH 9, 1933

Date		Spot	Feb.	Mar.	April	Sales
Feb.	7	2.96	2.85	2.96	2.98	15
	8	2.95	2.88	2.95	2.97	15
	9	3.00	2.90	2.97	2.99	31
	10	2.97	2.90	2.97	2.99	49
	11	2.96	2.89	2.96	2.98	13
	12					
	13		(Holiday)			
	14	2.94	2.85	2.92	2.95	124
	15	2.92	2.83	2.90	2.92	40
	16	2.90	2.81	2.88	2.90	35
	17	2.91	2.82	2.89	2.92	55
	18	2.93	2.82	2.89	2.92	15
	19					
	20	2.91	2.83	2.90	2.93	107
	21	2.91	2.83	2.90	2.94	68
	22					
	23	2.88	2.80	2.86	2.89	69
	24	2.88	—	2.88	2.89	60
	25	2.85	—	2.82	2.85	66
	26					
	27	2.81	—	2.79	2.82	115
	28	2.84	—	2.84	2.87	17
Mar.	1	2.88	—	2.86	2.88	17
	2	2.98	—	2.97	3.01	25
	3	2.97	—	2.97	3.01	6
	4	Exchange closed due to Bank Moratorium				
	5					
	6					
	7					
	8					
	9					

*This contract will be superseded by "No. 1B Standard" on April 1, 1933.

No. 1B Standard Contract of 10 Tons

FROM FEBRUARY 7 TO MARCH 9, 1933

Date		Spot.	Feb.	Mch.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Sales
Feb.	7	2.96	2.85	2.96	2.98	3.01	3.04	3.07	3.12	3.16	3.19	3.22	3.27	3.30	—	13
	8	2.95	2.88	2.95	2.97	2.99	3.02	3.06	3.11	3.16	3.19	3.22	3.26	3.31	—	21
	9	3.00	2.90	2.97	2.99	3.02	3.06	3.11	3.14	3.19	3.22	3.25	3.29	3.34	—	31
	10	2.97	2.90	2.97	2.99	3.02	3.06	3.10	3.14	3.18	3.22	3.25	3.28	3.33	—	35
	11	2.96	2.89	2.96	2.98	3.00	3.04	3.08	3.12	3.17	3.20	3.23	3.27	3.32	—	13
	12															
	13															
	14	2.94	2.85	2.92	2.95	2.99	3.01	3.05	3.10	3.15	3.18	3.21	3.25	3.30	—	59
	15	2.92	2.83	2.90	2.92	2.95	2.99	3.03	3.08	3.13	3.16	3.19	3.22	3.27	—	36
	16	2.90	2.81	2.88	2.90	2.92	2.96	3.01	3.05	3.09	3.12	3.16	3.20	3.25	—	44
	17	2.91	2.82	2.90	2.92	2.95	3.00	3.05	3.08	3.12	3.16	3.19	3.23	3.28	—	87
	18	2.93	2.82	2.89	2.92	2.95	3.00	3.05	3.09	3.14	3.17	3.20	3.23	3.28	—	30
	19															
	20	2.91	2.83	2.90	2.93	2.96	3.00	3.05	3.09	3.13	3.16	3.19	3.22	3.27	—	108
	21	2.91	2.83	2.90	2.94	2.99	3.02	3.05	3.09	3.14	3.18	3.21	3.24	3.28	—	88
	22															
	23	2.88	2.80	2.86	2.89	2.93	2.97	3.02	3.06	3.10	3.14	3.17	3.20	3.24	—	62
	24	2.88	—	2.87	2.89	2.91	2.96	3.01	3.06	3.10	3.14	3.17	3.20	3.24	—	58
	25	2.85	—	2.82	2.85	2.89	2.93	2.98	3.02	3.07	3.10	3.12	3.15	3.19	—	44
	26															
	27	2.81	—	2.79	2.82	2.85	2.90	2.95	2.99	3.03	3.06	3.09	3.13	3.18	—	110
	28	2.84	—	2.84	2.87	2.91	2.95	3.00	3.04	3.09	3.12	3.14	3.16	3.20	—	81
Mar.	1	2.88	—	2.86	2.88	2.90	2.95	3.00	3.04	3.09	3.12	3.15	3.18	3.23	3.27	42
	2	2.98	—	2.97	3.01	3.05	3.10	3.16	3.18	3.21	3.24	3.27	3.32	3.36	3.40	162
	3	2.97	—	2.97	3.01	3.06	3.10	3.15	3.20	3.25	3.29	3.32	3.35	3.41	3.45	106
	4	(Exchange closed due to Bank Moratorium)														
	5															
	6															
	7															
	8															
	9															

Rubber CHEMICAL Markets

NEW YORK, March 10, 1933.

ACCELERATORS

Organic				
A-1	lb.	.24	@	.27
A-5-10	lb.	.33	@	.36
A-7	lb.	.55	@	.59
A-11	lb.	.62	@	.66
A-16	lb.	.57	@	.61
A-19	lb.	.58	@	.62
A-32	lb.	.90	@	.95
Aldehyde ammonia, crystals	lb.	.65	@	.67
Altax	lb.			
Captax	lb.			
Cryiene	lb.	.55	@	.65
paste	lb.	.45	@	.55
Di-Ortho-Tolyguanidine	lb.	.42	@	.43
Diphenylguanidine	lb.	.33	@	.34
Ethylidene aniline	lb.	.45	@	.47½
Formaldehyde aniline	lb.	.37½	@	.42
Heptene	lb.	.40	@	—
Hexamethylene-tetramine	lb.	.46	@	.47
Lithex	lb.	.18	@	.20
Methylenedianiline	lb.	.36	@	.37
Monex	lb.	3.25	@	—
Oxynone	lb.	.68	@	.80
Phenex	lb.	.50	@	.55
R & H 40	lb.	.40	@	.41
R & H 50	lb.	.40	@	.41
R-2	lb.	1.95	@	2.15
Safex	lb.	1.20	@	1.25
SPDX	lb.	.75	@	—
Super-Sulphur No. 1	lb.			
No. 2	lb.			
Thiocarbanilid, drums	lb.	.25	@	.27
Trimene	lb.	.75	@	—
base	lb.	1.20	@	—
Triphenylguanidine	lb.	.58	@	.60
Tuads	lb.			
Ureka	lb.	.75	@	1.00
Vulcanex	lb.			
Vulcone	lb.			
Vulcanol	lb.			
Z-88-P	lb.	.50	@	.60
Zimate	lb.			
Inorganic				
Litharge, domestic	lb.	.05¾	@	—
Magnesia, calcined, light	per 100 lb.	5.35	@	5.45
heavy	per 100 lb.	3.65	@	3.75

COLORS

Blacks (See Compounding Materials)

Blues				
Prussian	lb.	.36	@	.37
Ultramarine	lb.	.06	@	.30
Browns				
Sienna, Italian	lb.	.04	@	.08
Umber, Turkey	lb.	.04	@	.06
Greens				
Chrome, light	lb.	.23	@	.26
medium	lb.	.26	@	.28
dark	lb.	.28	@	.33
Chromium Oxide, bbl.	lb.	.23	@	.27
Reds				
Antimony				
crimson, 15/7	lb.	.40	@	—
sulfur, free	lb.	.52	@	.56
Indian English	lb.	.09	@	.10
Domestic (Maroon)	lb.	.11	@	—
Red oxide, pure	lb.	.10	@	.12
Rub-Er-Red, f.o.b. Easton	lb.	.05¾	@	—
Whites				
Cryptone CB, No. 21	lb.	.06½	@	.06¾
Cryptone, No. 19	lb.	.06½	@	.06¾
Lithopone, Albalith	lb.	.04½	@	.04¾
Lithopone, Azolith	lb.	.04½	@	.04¾
Titanium oxide	lb.	.17	@	.19
Titanox B	lb.	.06	@	.06½
Titanox C	lb.	.06	@	.06½
XX Zinc Sulphide, bbls.	lb.	—	@	.13
Zinc Oxide—American Process				
American Azo:				
ZZZ (lead free)	lb.	.05¾	@	.06
ZZ (leaded)	lb.	.05½	@	.05¾
Horsehead Lead Free Brand:				
Selected	lb.	.05¾	@	.06
Special	lb.	.05¾	@	.06
XX Red	lb.	.05¾	@	.06
XX	lb.	.05¾	@	.06
XX Green	lb.	.05¾	@	.06
Leaded Brand, Standard	lb.	.05½	@	.05¾
Sterling	lb.	.05½	@	.05¾
Superior	lb.	.05¼	@	.05¾
Lehigh	lb.	.05¼	@	.05½
U. S. P., bbls.	lb.	—	@	.12¾
Kadox, black label	lb.	.09⅝	@	.09⅞
Blue label	lb.	.08⅝	@	.08⅞
Red label	lb.	.07¼	@	.07½
St. Joe, black label	lb.	.05¾	@	.06
green label	lb.	.05¾	@	.06
red label	lb.	.05¾	@	.06
Zinc Oxide—French Process				
Anaconda, lead free	lb.	.05¾	@	.06
Anaconda, selected lead free	lb.	.06¼	@	.06½
Florence White seal, bbls.	lb.	—	@	.10⅞
Green seal	lb.	.09⅝	@	.09⅞
Red seal	lb.	.08⅝	@	.08⅞
Yellows				
Chrome	lb.	.16	@	.16½
Ocher, dom. med.	lb.	.01½	@	.02

BLACKS

Arrow "Aerfloted"				
c.l. f.o.b. works, bags	lb.	.02¾	@	—
c.l. f.o.b. works, cases	lb.	.04¾	@	—
less c.l. f.o.b. works	lb.	.05¾	@	.07
Arrow "Aerfloted" Specification, c.l. f.o.b. wks., bags	lb.	.03	@	—
Bone, powdered	lb.	.05½	@	.12½
Carbon, compressed	lb.	.02¾	@	.07
uncompressed	lb.	.02¾	@	.07
"Certified," Cabot				
c.l. f.o.b. works, bags	lb.	.02¾	@	—
c.l. f.o.b. works, cases	lb.	.04¾	@	—
less c.l. f.o.b. works	lb.	.05¾	@	.07
Spherons	lb.	.02¾	@	—
"Disperso" f.o.b. La.	lb.	.025	@	.071
f.o.b. Texas	lb.	.02¾	@	.07
Drop, bbls.	lb.	.05¾	@	.11
"Excello," compressed	lb.	.03	@	—
"Fumonex"	lb.	.02½	@	.06
"Gastex"	lb.	.02½	@	.06
Lampblack	lb.	.06	@	.08
"Micronex"				
c.l. f.o.b. works, bags	lb.	.03	@	—
c.l. f.o.b. works, cases	lb.	.04½	@	—
less c.l. f.o.b. works	lb.	.05½	@	.07
"Supreme"	lb.	.02¾	@	—
Thermatomic—"F 56"	lb.	—		—
"Thermax"	lb.	—		—
United, "Dixie" and "Kosmos"				
c.l. f.o.b. works, bags	lb.	.02¾	@	—
c.l. f.o.b. works, cases	lb.	.04¾	@	—
less c.l. f.o.b. works	lb.	.05¾	@	.07
"Velvetex"	lb.	.02	@	.06

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.00	@	24.00
Ammonia carbonate, lump	lb.	.10½	@	.12
Asbestine	ton	14.40	@	16.00
Barium carbonate (95-100%)	lb.	.03	@	—
Barium Dust	lb.	.03	@	.05
Barytes southern off-color	ton	12.00	@	15.00
Western prime white	ton	35.00	@	—
Basofor	lb.	.04½	@	—
Bentonite	lb.	.02	@	.03
Blanc fixe dry f.o.b. works	ton	60.00	@	75.00
Carrara filler	lb.	.01¾	@	.02
Catalpo (tech.)	lb.	.02	@	—
Chalk, precipitated				
Suprex white, extra lt.	ton	60.00	@	70.00
heavy	ton	45.00	@	60.00
Clay, Kaolin, domestic	ton	6.00	@	7.00
Aerfloted, Suprex	ton	8.50	@	9.00
Congaree	ton	9.00	@	—
Dark Blue Ridge	ton			
Dixie	ton			
Langford	ton			
Lexington	ton	19.00	@	22.00
Par	ton			
Tensunite		10.00	@	—
Cotton Flock	lb.	.05	@	.16
Glues, extra white	lb.	.15	@	.22
medium white	lb.	.12	@	.14
Kalite No. 1	ton	30.00	@	55.00
Kalite No. 3	ton	40.00	@	65.00
Magnesia, carbonate	lb.	.05¾	@	.06
Mica	lb.	.04	@	—
Rottonstone (powdered)	ton	23.50	@	28.00
Soapstone, powdered	ton	16.00	@	18.00
Starch, powdered	cwt.	2.34	@	—
Talc, domestic	ton	12.00	@	15.00
Pyrax A	ton			
Whiting, commercial	cwt.	.85	@	1.10
English cliffstone	cwt.	1.50	@	1.70
Sussex	ton			
Witco	ton	20.00	@	—
Zinc Carbonate	lb.	.10½	@	—
Zinc Stearate	lb.	.20½	@	—

MINERAL RUBBER

Genasco (factory	ton	40.00	@	42.00
Granulated M. R.	ton			
Hard Hydrocarbon	ton			
Parmr, solid	ton	28.00	@	28.00
Pioneer, MR, solid	ton	40.00	@	42.00
Pioneer-granulated	ton	50.00	@	52.00
R & H Hydro-Carbon	ton	27.05	@	29.00

SOFTENERS

Acids				
Nitric, 36 degrees	cwt.	5.00	@	5.25
Sulfuric, 66 degrees	cwt.	1.60	@	1.95
Tartaric, crystals	lb.	.20	@	.20½
Acids, Fatty				
Laurex	lb.	.15	@	.16
Stearex	lb.	.08	@	.12
Stearic, double pressed	lb.	.08	@	.12
Alkalies				
Caustic Soda, 76%	cwt.	2.00	@	2.50
Soda Ash, 58% C.L.	cwt.	1.15	@	1.35
Oils				
Corn, refined, bbls.	lb.	.05½	@	.06
Cottonseed, crude		.03½	@	.04
Degras (c.l. 100 bbls.)	lb.	.02¾	@	—
Less c.l. (10-25 bbls.)	lb.	.03	@	—
Lots less than 10 bbls.	lb.	.03¼	@	—
Fluxrite	lb.	.05½	@	.06¼
Palm Lagos	lb.	.03¼	@	.03½
Niger	lb.	.02¾	@	.03
Para-Flux	gal.	.17	@	—
Petrolatum, white	lb.	.08	@	.08¼
Pigmentaroil	gal.	.13	@	.18
Pine, steam distilled	gal.	.59	@	.61
destructively distilled	gal.	.56	@	.58
Witco Palm Oil	lb.	.07¼	@	—
Witco Softener (f.o.b. wks.)	lb.	.02	@	—
Resins and Pitches				
Pitch, Burgundy	lb.	.05	@	.06
coal tar	gal.	.05½	@	.06
pine, 200 lb. gr. wt.	bbl.	6.00	@	—
Rosin, grade K, 280 lb.	bbl.	4.30	@	—
Pigmentar	gal.	.13	@	.18
Tar Retort, 50 gal.	bbl.	9.50	@	10.00
Solvents				
Acetone, pure	lb.	.08	@	.09½
Alcohol, denatured, No. 1 bbls.	gal.	.30½	@	.41½
Benzol, 90%	gal.	.20	@	.21
Carbon, bisulfide	lb.	.05½	@	.06¾
Carbon, tetrachloride	lb.	.06¼	@	.07
Dipentene	gal.	.31	@	.41
Dryolene (f.o.b. Okla.)	gal.	.10	@	.10½
Gasoline, steel bbls.	gal.	.16	@	—
Naphtha, solvent	gal.	.26	@	.31
Rub-Sol (f.o.b. Okla.)	gal.	.09	@	—
Turpentine, spirits	gal.	.47	@	.51
wood	gal.	.42	@	—
destructively distilled	gal.	.37	@	—
Waxes				
Beeswax, white	lb.	.30	@	.32
Carnauba	lb.	.25	@	.26
Ceresin, white	lb.	.10	@	.11
Montan, crude	lb.	.05	@	.06
Ozokerite, black	lb.	.24	@	.25
green	lb.	.26	@	.30
Paraffin (c.l.—f.o.b. N. Y.)				
Yellow crude scale	lb.	.02	@	—
White crude scale 124/126	lb.	.02	@	—
Refined, 125/127	lb.	.02¾	@	—
Refined, 128/130	lb.	.03¼	@	—
Refined, 135/137	lb.	.04	@	—
Refined, 138/140	lb.	.06¾	@	—

ANTI-OXIDANTS

AgeRite, Gel	lb.			
Powder	lb.			
Resin	lb.			
White	lb.			
Albasan	lb.	.70	@	.75
Antox	lb.			
B-L-E	lb.	.57	@	.60
Flectol-A	lb.	—	@	—
Neozone	lb.			
Oxynone	lb.	.68	@	.80
Retardex	lb.	.35	@	.40
Stabilite	lb.	.57	@	.62
Stabilite Alba	lb.	.70	@	.75
VGB	lb.	.55	@	.60

SPECIALTIES

Aromatics Rodo	lb.			
Sunproof	lb.	.35	@	.37½
Sponge Paste	lb.	—	@	.30
Tonox	lb.	.56	@	.60

SUBSTITUTES

Black	lb.	.06	@	.08
White	lb.	.08	@	.12
Brown	lb.	.07	@	.11

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.04	@	—
Sulfur flour,				
Ref'n'd. 100% pure (bags)	cwt.	2.40	@	2.70
Commercial (bags	cwt.	1.75	@	2.10
Telloy	lb			

Crude Rubber
Latex and Guayule
Reclaimed Rubber
Tires and Tubes

STATISTICS OF THE INDUSTRY

Rim Production
Automobiles
Gasoline
Cotton Prices

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Gross Imports: Total Declared Value	Gross Imports: Average Declared Value per pound Cents	Re-exports: Long Tons	Re-exports: Total Declared Value	Re-exports: Average Declared Value per pound Cents	Net Imports: Long Tons
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,914	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,138	72,918,949	6.54	25,595	4,255,472	7.42	471,543
1932	409,584	31,936,459	3.47	20,929	2,015,612	4.30	388,655
1931:							
Apr.	44,536	7,712,941	7.73	2,607	528,947	9.06	41,929
May	35,526	5,886,638	7.40	2,501	418,301	7.47	33,025
June	46,233	6,918,900	6.68	2,749	440,604	7.15	43,484
July	43,469	6,023,748	6.19	1,435	223,587	6.96	42,034
Aug.	38,669	5,138,404	5.93	2,324	345,953	6.65	36,345
Sept.	38,494	4,970,324	5.76	1,362	187,431	6.14	37,132
Oct.	41,131	4,803,582	5.21	1,527	203,574	5.95	39,604
Nov.	43,345	4,742,218	4.72	1,403	198,284	6.31	43,345
Dec.	53,536	5,610,120	4.68	2,462	326,382	5.91	51,070
1932:							
Jan.	33,221	3,387,505	4.55	1,524	185,466	5.43	31,697
Feb.	27,959	2,690,250	4.29	1,915	222,584	5.19	26,044
Mar.	45,197	4,251,801	4.19	2,227	240,128	4.84	42,970
April	37,903	3,181,343	3.74	2,128	196,934	4.53	35,775
May	34,182	2,798,914	3.71	1,505	144,561	4.30	32,677
June	40,808	2,647,085	2.89	1,981	134,336	3.02	39,136
July	32,306	2,102,915	2.91	2,030	179,699	3.95	30,276
August	33,449	2,027,045	2.71	1,339	128,952	4.29	32,110
Oct.	35,096	2,436,522	3.10	1,059	98,022	4.13	34,037
Nov.	28,908	2,263,469	3.48	1,745	158,618	4.06	27,163
Dec.	31,384	2,360,061	3.34	770	66,165	3.98	30,614
1933							
Jan.	29,822	2,213,828	3.03	1,403	109,916	3.49	28,419

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All quantities in Long Tons)

	Guayule: Tons	Guayule: Dollars	Balata: Tons	Balata: Dollars	Jelutong: Tons	Jelutong: Dollars	Liquid Latex (1): Tons	Liquid Latex (1): Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1932	—	—	708	147,403	4,607	616,596	5,085	601,999
1932:								
Mar.	—	—	114	20,628	460	59,299	391	44,585
Apr.	—	—	46	10,909	317	44,165	551	46,397
May	—	—	42	9,863	566	68,028	141	27,449
June	—	—	38	9,488	330	47,077	309	28,800
July	—	—	26	7,934	372	52,116	218	37,327
Aug.	—	—	36	8,885	367	46,926	540	59,178
Sept.	—	—	11	2,261	216	27,265	297	46,380
Oct.	—	—	84	17,451	349	48,816	711	69,053
Nov.	—	—	134	15,983	163	20,296	526	70,785
Dec.	—	—	22	5,209	276	36,298	632	79,250
1933								
Jan.	—	—	33	7,815	357	40,586	841	100,900

(1) Latex import figures not available before 1924.

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1926	1927	1928	1929	1930	1931	1932	1933
Jan.	32,196	31,518	34,403	43,002	36,194	28,557	27,962	21,661
Feb.	31,136	30,137	33,702	41,594	33,302	28,797	30,011	—
Mar.	32,936	36,141	35,688	44,730	35,540	32,788	27,828	—
Apr.	32,696	35,871	32,772	47,521	39,686	33,321	25,953	—
May	29,364	34,592	37,333	49,233	39,386	37,817	29,197	—
June	28,598	33,801	37,676	43,227	34,195	37,916	39,116	—
July	27,577	29,219	37,407	41,526	29,508	31,937	28,272	—
Aug.	34,533	33,460	42,927	38,274	30,850	27,586	22,372	—
Sept.	32,904	27,214	39,882	34,707	25,515	23,638	22,491	—
Oct.	29,936	26,790	40,857	34,800	27,516	22,277	21,018	—
Nov.	28,080	26,792	37,461	27,659	23,691	22,943	21,910	—
Dec.	26,293	25,492	31,232	23,531	21,687	21,409	16,990	—
Totals	366,149	371,027	441,340	469,804	375,980	348,986	313,122	—

Figures on Quarterly Basis

Quarter	1925	1926	1927	1928	1929	1930	1931	1932
Jan./Mar.	95,263	94,301	99,216	103,558	128,565	101,610	89,652	85,309
Apr./June	104,099	87,109	103,242	103,500	139,292	112,229	107,755	92,643
July/Sept.	99,493	93,793	89,210	117,573	113,746	85,261	83,632	72,523
Oct./Dec.	85,789	83,212	80,860	117,597	84,872	72,020	65,645	64,145
Totals	384,644	358,415	372,528	442,227	466,475	371,120	346,684	314,620

Note—The Rubber Association estimates its monthly rubber consumption figues to be 80 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

Year	Production	Consumption: Tons	Consumption: % to Crude	Stocks*	Year	Production	Consumption: Tons	Consumption: % to Crude	Stocks*
1922	57,834	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1925	132,930	137,105	35.6	13,203	1930	157,967	153,497	40.8	22,000
1926	180,582	164,500	45.9	23,213	1931	133,351	124,126	33.9	19,257
1932:									
Jan.	8,753	8,440	30.2	18,712	July	5,417	5,131	18.1	16,333
Feb.	8,731	8,332	27.7	18,659	Aug.	3,264	4,382	18.6	14,629
Mar.	8,613	7,420	26.7	19,721	Sept.	5,308	5,235	23.2	14,059
Apr.	5,561	5,555	21.6	21,525	Oct.	6,605	5,494	26.1	13,911
May	5,024	6,070	20.8	18,889	Nov.	6,542	5,234	23.9	14,047
June	5,923	7,031	18.0	16,870	Dec.	5,626	3,968	23.4	15,202
1933:									
Jan.	5,245	4,506	20.8	15,117	July	.....	.....	.....	.....
Feb.	.....	.....	.....	.....	Aug.	.....	.....	.....	.....
Mar.	.....	.....	.....	.....	Sept.	.....	.....	.....	.....
Apr.	.....	.....	.....	.....	Oct.	.....	.....	.....	.....
May	.....	.....	.....	.....	Nov.	.....	.....	.....	.....
June	.....	.....	.....	.....	Dec.	.....	.....	.....	.....

* Stocks on hand at the end of month or year.

(Rubber Manufacturers' Association figures raised to 100%)

U. S. Consumption of Gasoline

(In Thousands of Barrels of 42 Gallons)

	1931	1932	1933		1931	1932	1933
January	26,844	26,063	26,442	July	39,459	31,317	.....
February	26,133	25,344	.....	August	39,459	35,207	.....
March	31,037	29,451	.....	September	36,670	33,645	.....
April	33,400	30,252	.....	October	35,051	22,255	.....
May	35,716	31,574	.....	November	30,640	30,294	.....
June	38,375	38,766	.....	December	30,529	27,191	.....

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

1931	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
January	—	8⅝	8⅝	—	8¼	8⅝	8⅝	8⅝	8⅝	8⅝	—	8⅝	8⅝	8⅝	8½	8⅝	8⅝	—	8⅝	8¾	8¾	8¾	8¾	8¾	8¾	8¼	8⅛	8⅛	8⅛	8	8	8⅜
February	—	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	—	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	—	7⅝	7⅝	7⅝	7⅝	7⅝	—	—	—	7⅝
March	—	8	8⅝	8⅝	8⅛	8⅝	—	7⅞	7⅞	8	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7	7	—	7	—	7⅞
April	6⅝	6	—	—	6⅛	6⅛	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6	6	6⅝	6⅝	6½	6	6	—	6⅛
May	6	—	—	6⅛	6⅛	6⅝	6⅝	—	6⅝	6⅝	6⅛	6⅝	6⅝	6⅛	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅛	6⅛	6⅝	6⅝	6⅝	6½	6⅝	—	6⅛
June	6⅝	6⅝	6⅝	6⅝	6⅛	6⅝	—	6⅝	6⅝	6⅝	6⅛	6⅝	6⅝	6⅛	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅛	6⅛	6⅝	6⅝	6⅝	6½	6⅝	—	6⅛
July	6⅝	6⅝	6⅝	6⅝	6⅛	6⅝	6⅝	6⅝	6⅝	6⅝	6⅛	6⅝	6⅝	6⅛	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅛	6⅛	6⅝	6⅝	6⅝	6½	6⅝	—	6⅛
August	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5½	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5¼	5⅝	5⅝	5⅝	5⅝	5¼	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5¼	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝
September	5⅝	5⅝	4⅝	—	5⅝	—	5⅝	5⅝	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4⅝	5	5	4⅝	4⅝	4⅝	4⅝	5⅛
October	4⅝	4⅝	—	4⅝	—	4⅝	4⅝	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
November	—	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½
December	—	4⅝	4⅝	4⅝	4½	—	4⅝	4⅛	4⅝	4⅝	4⅝	4⅝	—	4½	4½	4½	4½	4½	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
1932																																
January	—	—	—	4⅛	4½	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	—	4⅝	4⅝	4⅝	4⅝	—	—	4⅛
February	—	4⅝	4⅛	4⅛	4⅛	4⅛	—	4⅝	4⅝	—	4	4⅝	4⅝	—	4⅛	4⅝	4	4	—	4	4	—	3	3⅛	4	3⅝	—	3⅝	3⅝	—	—	4
March	—	4⅝	4⅛	4⅛	4⅛	—	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝
April	—	3	—	3	2⅝	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
May	—	3	3⅛	3⅛	3⅛	3⅛	4	4	4	3⅝	3⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝
June	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝
July	2⅝	—	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝
August	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3½	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛
September	4⅛	4⅛	—	4⅛	3⅝	3⅝	4	4½	4½	4	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝
October	3⅝	—	3⅝	3⅝	3⅝	3⅝	3⅝	3½	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝
November	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½
December	3⅝	3⅝	3⅝	—	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛
1933																																
January	—	3⅛	3⅛	3⅛	3⅛	3⅛	2⅝	—	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	—	3⅛	3⅛	2⅝	3	3⅛	3	—	3	3⅛	3⅛	3⅛	3⅛	2⅝	2⅝	2⅝	2⅝	3
February	—	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝
March	—	2⅝	3⅛	3⅛	3⅛	—	—	—	*	*	*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1929

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15	1922	17.50	1926	48.50
1911	141.30	1915	65.85	1919	48.70	1923	29.45	1927	37.72
1912	121.60	1916	72.50	1920	36.30	1924	26.20	1928	22.48
1913	82.04	1917	72.23	1921	16.36	1925	72.46	1929	20.55

Average Monthly Price per Pound Since 1927

Month	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents	1932 Cents	1933 Cents
Jan.	38.75	40.25	20.14	15.24	8.34	4.38	3.08
Feb.	38.25	32.75	23.97	15.85	7.70	4.03	2.95
Mar.	41.04	26.82	24.55	15.34	7.71	3.35	—
Apr.	40.86	18.97	21.18	14.93	6.43	3.02	—
May	40.76	18.99	21.46	14.24	6.49	3.09	—
June	37.25	19.59	20.64	12.45	6.35	2.66	—
July	34.87	19.40	21.30	11.24	6.37	2.89	—
Aug.	35.12	19.46	20.59	9.96	5.38	3.63	—
Sept.	33.67	18.47	20.37	8.28	5.08	3.84	—
Oct.	34.32	18.83	19.67	8.20	4.87	3.65	—
Nov.	37.58	18.26	16.62	9.01	4.65	3.44	—
Dec.	40.63	17.97	16.12	9.05	4.64	3.24	—
Average for Year	37.72	22.48	20.55	11.98	6.17	3.49	—

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Dec.	Jan.	Feb.	Mar	Day	Dec.	Jan.	Feb.	Mar
1	2 1/16	—	2 1/16	2 1/16	17	2 11/32	2 1/4	2 1/16	—
2	2 11/32	—	2 1/16	2 1/16	18	—	2 3/32	2 1/16	—
3	* 2 11/32	2 11/32	2 1/16	2 1/16	19	2 1/2	2 5/32	—	—
4	—	2 11/32	2 1/16	—*	20	2 11/32	2 3/32	2 3/32	—
5	2 5/32	2 11/32	—	—	21	2 1/2	2 1/16	2 3/32	—
6	2 1/2	2 11/32	2 1/16	—*	22	2 11/32	—	—	—
7	2 5/32	2 11/32	2 1/16	—*	23	2 11/32	2 3/32	2 1/16	—
8	2 1/16	—	2 3/32	—*	24	—	2 1/16	2 1/16	—
9	2 11/32	2 1/16	2 1/16	—*	25	—	2 1/16	2 1/16	—
10	2 1/16	2 1/16	2 1/16	—	26	—	2 3/32	—	—
11	—	2 11/32	2 1/16	....	27	—	2 1/16	2 3/32	—
12	2 1/16	2 11/32	—	—	28	2 11/32	2 1/16	2 3/32	—
13	2 1/16	2 1/16	—	—	29	2 1/16	—	—	—
14	2 1/16	2 1/16	2 3/32	—	30	2 1/16	2 3/32	—	—
15	2 1/16	—	2 3/32	—	31	—	2 1/16	—	—
16	2 1/16	2 1/16	2 3/32	—					

Average Monthly Price Per Pound

Month	1930 Pence	1931 Pence	1932 Pence	1933 Pence	Month	1930 Pence	1931 Pence	1932 Pence	1933 Pence
Jan.	7.471	4.160	3.052	2.264	Aug.	4.880	2.385	2.654	—
Feb.	7.948	3.823	2.760	2.093	Sept.	4.075	2.524	2.485	—
Mar.	7.595	3.822	2.047	—	Oct.	4.023	2.898	2.425	—
Apr.	7.391	3.082	1.876	—	Nov.	4.440	2.890	2.518	—
May	6.926	3.035	1.825	—	Dec.	4.516	3.115	2.444	—
June	6.195	3.082	1.750	—	Average for Year	5.926	3.155	2.434	—
July	5.648	3.048	1.875	—					

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Jan.	Feb.	Mar.	Day of Month	Jan.	Feb.	Mar.	Day of Month	Jan.	Feb.	Mar.
1	—	5.90	6.15	11	6.25	6.10	—	21	6.25	6.10	—
2	—	5.90	6.10	12	6.25	—	—	22	—	—	—
3	6.10	6.00	6.35	13	6.25	—	—	23	6.30	6.05	—
4	6.30	5.95	*	14	6.25	6.00	—	24	6.30	6.15	—
5	6.25	—	—	15	—	6.05	—	25	6.25	5.95	—
6	6.25	6.00	*	16	6.15	6.05	—	26	6.20	—	—
7	—	6.05	*	17	6.30	6.15	—	27	6.25	6.05	—
8	—	6.05	*	18	6.20	6.15	—	28	6.25	6.05	—
9	6.30	6.15	*	19	6.25	—	—	29	—	—	—
10	6.40	6.15	—	20	6.25	6.15	—	30	6.10	—	—
								31	6.00	—	—

Average Monthly Price Per Pound

Month	1930 Cents	1931 Cents	1932 Cents	1933 Cents	Month	1930 Cents	1931 Cents	1932 Cents	1933 Cents
Jan.	17.21	10.27	6.65	6.23	Aug.	12.03	7.21	7.43	—
Feb.	15.62	10.96	6.85	6.05	Sept.	10.85	6.52	6.30	—
Mar.	15.15	10.90	6.86	—	Oct.	10.63	6.32	6.30	—
Apr.	16.39	10.19	6.16	—	Nov.	10.96	6.44	6.22	—
May	16.43	9.38	5.72	—	Dec.	10.92	6.24	6.00	—
June	14.48	9.05	5.22	—	Average for Year	13.57	8.56	6.41	—
July	13.10	9.28	5.87	—					

*Exchanges closed due to Bank Moratorium.

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1931	1932	1933	AFLOAT 1931	1932	1933	ON HAND AND AFLOAT 1931	1932	1933
Jan.	209,487	322,860	396,376	56,187	42,234	32,539	265,674	365,094	428,915
Feb.	212,833	322,117	.....	63,680	51,728	.....	276,513	373,845	.....
Mar.	217,804	334,566	.....	63,133	44,190	.....	280,937	378,756	.....
Apr.	228,382	343,099	.....	56,700	40,387	.....	285,082	383,486	.....
May	220,799	346,231	.....	73,564	50,453	.....	294,363	396,684	.....
June	225,536	345,702	.....	69,421	43,079	.....	294,957	388,781	.....
July	234,822	345,927	.....	66,873	37,894	.....	301,695	383,821	.....
Aug.	240,816	357,342	.....	61,469	41,282	.....	302,285	398,624	.....
Sept.	254,324	365,789	.....	62,420	46,188	.....	316,744	411,977	.....
Oct.	273,456	373,823	.....	68,427	40,176	.....	341,883	413,999	.....
Nov.	292,493	377,996	.....	77,443	40,876	.....	369,936	418,875	.....
Dec.	322,826	388,229	.....	53,940	38,360	.....	376,766	426,589	.....

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1931	1932	1933	At end of	1931	1932	1933
Jan.	81,093	67,166	.....	July	81,317	48,842	.....
Feb.	82,265	65,942	.....	Aug.	81,560	47,079	.....
Mar.	84,736	64,280	.....	Sept.	79,692	44,942	.....
Apr.	86,982	61,848	.....	Oct.	76,778	42,327	.....
May	86,726	56,089	.....	Nov.	73,911	40,606	.....
June	83,071	51,009	.....	Dec.	69,470	37,407	.....

At End of Recent Weeks

1932	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
September	46,982	45,325	46,176	44,986	
October	44,972	44,503	43,729	43,173	42,614
November	42,114	41,528	40,952	41,025	
December	40,267	39,381	38,388	37,862	37,741
1933					
January	37,410	37,361	37,615	36,852	
February	37,188	37,396	37,559	37,603	
March	38,303				

Stocks in Liverpool

1932				
April	61,010	60,872	61,302	61,433	61,480
May	61,674	60,909	60,588	60,148	
June	60,119	59,551	58,601	58,441	
July	58,569	58,335	57,622	57,618	57,866
August	58,019	57,762	57,542	57,448	
September	58,080	57,965	58,028	58,004	
October	58,261	58,209	57,881	57,568	57,702
November	57,311	57,329	57,021	56,004	
December	55,774	55,311	54,841	54,907	55,056
1933					
January	57,711	52,950	53,183	52,415	
February	52,232	52,434	52,799	52,955	
March	53,850				

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1930	1931	1932	1933	End of	1930	1931	1932	1933
Jan.	39,727	48,802	48,850	22,525	July	45,459	51,203	17,017	.....
Feb.	44,371	49,283	46,954	.....	Aug.	48,132	48,971	20,649	.....
Mar.	45,657	49,590	46,591	.....	Sept.	44,015	47,025	20,415	.....
Apr.	48,473	45,868	39,663	.....	Oct.	39,930	52,132	23,158	.....
May	44,715	44,278	38,690	.....	Nov.	41,674	46,497	25,419	.....
June	42,451	47,517	19,770	.....	Dec.	45,963	45,795	25,341	.....

STOCKS IN OTHER CENTRES

End of 1932:	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Apr.	42,642	15,660	3,404	3,407	6,469
June	40,184	20,240	3,274	3,727	5,885
July	38,681	21,190	2,996	3,781	5,982
Aug.	38,539	21,250	2,625	3,347	5,829
Sept.	36,346	21,040	2,246	2,834	5,823
Oct.	38,125	19,020	2,208	3,219	6,012
Nov.	36,363	21,860	2,229	3,565	5,530
Dec.	40,222	20,000	2,170	3,844	5,552
1933:					
Jan.	38,844	20,000			

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1928	24,247,282	81.6
1924	21,863,311	19.7	1929	24,141,502	80.3
1925	26,001,664	66.8	1930	17,364,096	80.1
1926	24,199,524	78.8	1931	11,253,800	76.7
1927	19,700,003	79.1	1932	6,004,252	78.7
1932:			1933:		
July	338,725	82.2	January	727,308	79.1
August	221,913	53.8			
September	197,999	64.5			
October	237,498	77.7			
November	454,947	77.5			
December	558,674	80.0			

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1925	1926	1927	1928	1929	1930	1931	1932
Production	60,845	61,237	64,439	77,944	68,726	50,965	48,739	40,085
Shipments	59,262	59,002	64,059	74,296	69,395	53,638	48,151	40,260
Inventory[2]	8,142	10,456	10,264	13,624	11,838	9,003	7,775	7,644

Figures for Recent Months

	PRODUCTION 1931	1932	1933	SHIPMENTS 1931	1932	1933	INVENTORY 1931	1932	1933
Jan.	3,675	3,462	.....	3,744	3,253	.....	8,957	7,912	.....
Feb.	3,985	3,871	.....	3,402	2,553	.....	9,536	9,172	.....
Mar.	4,663	3,671	.....	4,122	2,954	.....	10,014	9,878	.....
Apr.	4,944	3,517	.....	4,932	3,698	.....	10,031	9,846	.....
May	5,679	3,820	.....	5,415	4,258	.....	10,312	9,379	.....
June	5,672	5,643	.....	5,572	10,065	.....	10,447	4,999	.....
July	4,926	3,617	.....	5,462	2,404	.....	9,919	6,203	.....
Aug.	3,906	3,089	.....	4,960	2,655	.....	8,896	6,659	.....
Sept.	3,172	2,539	.....	3,932	3,082	.....	8,158	6,096	.....
Oct.	2,974	2,569	.....	2,852	1,799	.....	8,300	6,876	.....
Nov.	2,500	2,304	.....	2,887	1,711	.....	7,919	7,454	.....
Dec.	2,643	1,983	.....	2,781	1,819	.....	7,775	7,644	.....

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1925	1926	1927	1928	1929	1930	1931	1932
Production	82,614	76,618	70,823	80,180	68,829	52,420	48,333	36,801
Shipments	81,004	71,591	72,896	77,127	70,592	54,938	50,021	37,935
Inventory[2]	11,313	16,200	13,692	16,117	12,807	9,999	7,922	6,749

Figures for Recent Months

	PRODUCTION 1931	1932	1933	SHIPMENTS 1931	1932	1933	INVENTORY 1931	1932	1933
Jan.	3,623	3,308	.....	4,062	3,529	.....	9,439	7,719	.....
Feb.	3,916	3,281	.....	3,400	2,728	.....	9,921	8,760	.....
Mar.	4,450	3,502	.....	3,789	2,686	.....	10,475	9,448	.....
Apr.	4,617	3,225	.....	4,636	3,385	.....	10,413	9,441	.....
May	5,413	3,409	.....	5,281	3,867	.....	10,549	8,913	.....
June	5,358	5,279	.....	5,397	9,019	.....	10,504	5,174	.....
July	4,955	2,937	.....	5,831	2,160	.....	9,589	5,975	.....
Aug.	4,435	2,748	.....	5,301	2,503	.....	8,774	6,127	.....
Sept.	3,449	2,601	.....	4,150	3,098	.....	8,095	5,753	.....
Oct.	3,077	2,187	.....	2,813	1,658	.....	8,321	6,214	.....
Nov.	2,443	2,005	.....	2,594	1,578	.....	8,119	6,662	.....
Dec.	2,597	1,779	.....	2,767	1,724	.....	7,922	6,749	.....

(1) **Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.**

(2) **Held by manufacturers at end of period indicated.**

Automobile Production

	United States Total	Passenger Cars	Trucks	Canada Total	Passenger Cars	Trucks	Grand Total
1926	4,298,799	3,808,753	490,046	205,002	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,850	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932							
Jan.	119,344	98,803	20,541	3,731	3,112	619	123,075
Feb.	117,418	94,110	23,308	5,477	4,494	983	122,895
Mar.	118,959	99,399	19,560	8,818	6,604	1,714	127,277
Apr.	148,326	120,937	27,389	6,810	5,660	1,150	155,136
May	185,149	157,756	26,539	8,221	7,269	952	193,370
June	183,092	160,338	22,768	7,112	6,308	804	190,204
July	111,139	94,705	14,438	7,472	6,773	699	118,611
Aug.	90,324	75,907	14,418	4,067	3,166	901	94,391
Sept.	84,141	64,748	19,402	2,342	1,741	601	86,483
Oct.	48,934	35,107	13,595	2,923	2,361	562	51,857
Nov.	59,556	47,532	12,025	2,204	1,669	535	61,760
Dec.	107,403	86,149	21,204	2,139	1,561	578	109,542
Total	1,370,728	1,135,541	235,187	60,816	50,718	10,098	1,431,544
1933							
Jan.	130,114	108,397	21,717	3,358	2,921	437	

Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[1]							
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[6]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[4]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,866
1925	316,824	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	658,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	858,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,292	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1932:															
Jan.	42,638	10,304	32,334	4,893	732	756	460	457	5,155	8,815	8,913	1,796	831	199	65,341
Feb.	42,008	8,008	34,000	4,533	803	696	460	334	4,814	6,011	6,534	1,060	352	203	59,800
Mar.	39,903	6,658	33,245	3,462	284	501	460	217	4,946	6,853	6,299	774	715	77	57,843
Apr.	36,670	4,682	31,988	3,210	365	459	345	130	6,722	6,090	4,935	962	487	99	55,792
May	40,297	5,677	34,620	3,824	304	595	344	118	6,552	6,551	6,012	964	416	278	60,578
June	36,566	5,665	30,901	3,444	359	481	345	166	5,610	7,516	5,507	1,218	394	139	56,080
July	40,723	5,346	35,377	3,501	99	442	400	184	5,779	6,257	6,145	1,233	232	141	59,790
Aug.	38,327	7,371	31,956	4,717	129	506	400	300	4,803	4,882	7,244	1,088	303	49	56,377
Sept.	41,973	8,869	33,104	5,129	122	614	400	340	3,858	6,485	7,664	1,621	318	78	59,733
Oct.	37,931	9,798	28,133	2,945	139	583	350	428	4,022	7,051	8,944	1,147	414	247	54,403
Nov.	40,098	10,072	30,026	4,146	185	683	350	371	4,368	6,250	9,080	809	1,164	156	57,588
Dec.	40,118	10,089	30,029	5,169	367	644	350	406	4,683	7,066	8,594	1,211	824	150*	59,493
1933:															
Jan.	46,599	7,857	38,742	4,641		590		305	4,843	5,720	6,837	968			
Feb.				5,039											

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,265 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,802
1920	249,530	56,844	13,855	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,185	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,629
1922	296,594	11,724	24,852	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,202
1925	385,596	4,061	32,956	23,957	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	35,892	26,405	20,521	11,351	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,498	37,255	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,098	49,275	35,453	34,284	17,169	11,774	15,586	9,445	3,022	6,440	864	4,650	894,639
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,261	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	52,383	42,506	45,121	20,917	56,027		30,763			2,851	7,252	4,359	10,244	
1932:															
Jan.	32,028	3,248	2,588	3,303	1,746	5,782	627	3,258	622	521	479	840	462	197	55,701
Feb.	26,488	5,930	2,898	4,356	1,723	6,781	1,189	2,931	758	506	500	708	313	306	55,382
Mar.	43,361	3,585	2,482	3,436	2,588	5,398	1,423	2,745	1,211	721	112	456	359	644	68,521
Apr.	36,326	6,826	2,956	3,787	1,600	3,684	1,083	764	1,549	347	348	474	417	1,259	61,870
May	22,818	1,110	2,277	3,447	1,416	3,917	1,033	3,743	2,048	617	286	707	272	350	54,041
June	39,136	1,853	3,666	3,405	2,884	2,834	1,534	5,291	1,421	449	127	578	196	280	63,604
July	30,494	4,081	3,125	3,280	1,529	2,544	1,116	1,785	624	723	—214	784	258	1,207	51,386
Aug.	32,650	6,672	4,919	4,006	970	3,390	1,615	1,740	751	1,211	—66	611	210	557	59,236
Sept.	26,865	5,688	5,845	3,674	2,770	5,878	971	1,376	625	964	103	534	267	406	55,966
Oct.	34,748	4,627	4,715	4,177	1,207	5,653	510	1,853	569	627	553	537	489	986	61,251
Nov.	27,689	5,836	3,850	3,577	1,593	4,563	1,265	1,481	1,653	1,035	275	489	631	659	54,567
Dec.	31,246	2,927	3,205	4,623	941	5,603		3,720			348	544	485	2,602	
1933:															
Jan.	29,260	3,277				7,611									

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are included in this compilation. *Figure is provisional; final figure will be shown immediately it becomes available.

A Section Devoted to Listings of Leading Producers and Distributors of Raw Materials, Machinery and Equipment, and Supplies for the Rubber Industry.

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Chemicals and Compounding Materials — Machinery and Equipment—Crude, Reclaimed and Scrap Rubber—Fabrics—Rubber Products — Consulting Engineers.

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